

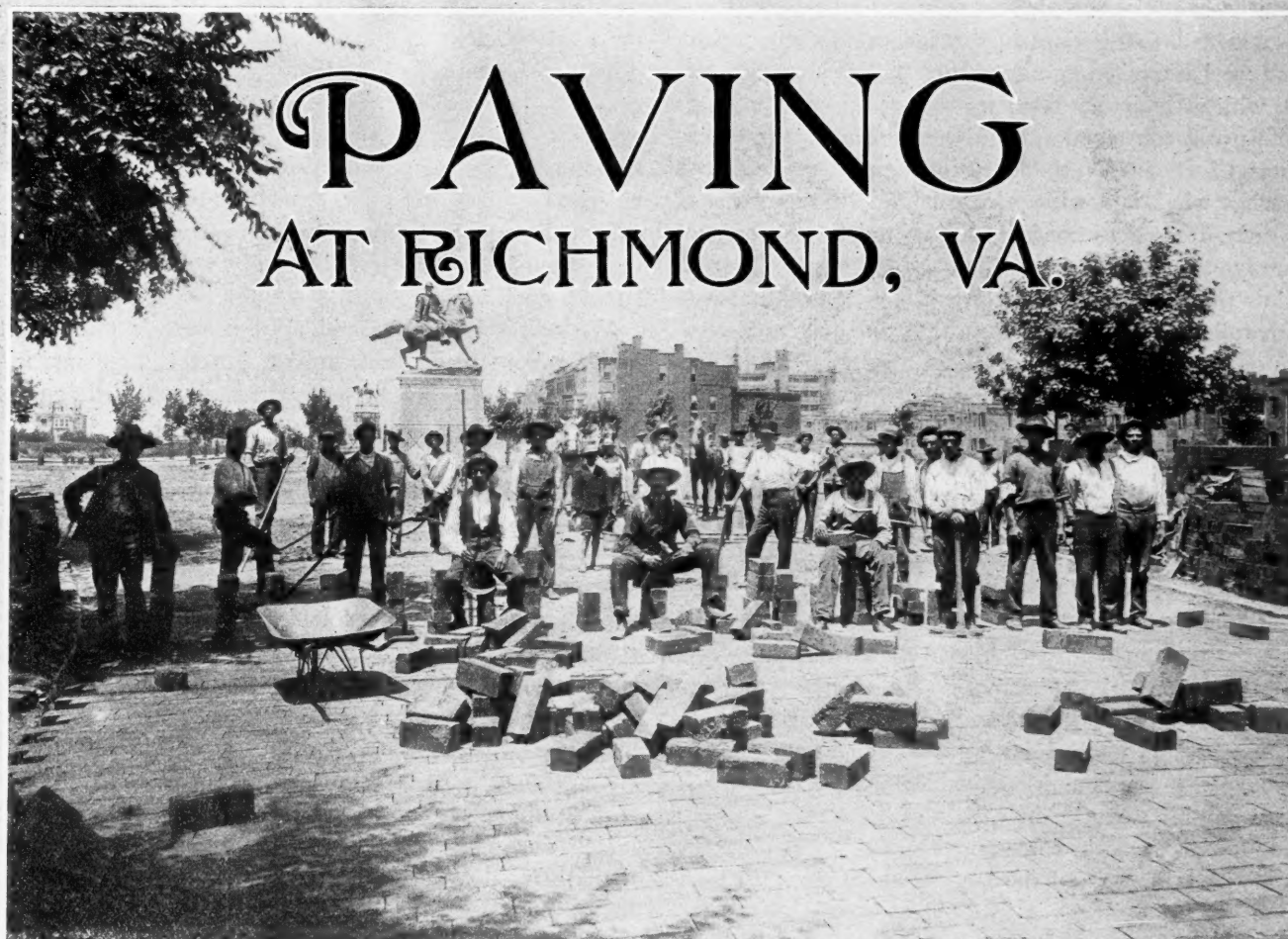
# Municipal Journal

## And Engineer

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No. 10



ASPHALT BLOCK PAVING ON FRANKLIN STREET

GENERAL J. E. B. STUART'S MONUMENT IN THE FOREGROUND; GENERAL ROBERT E. LEE'S IN THE BACKGROUND

By P. P. TALIAFERRO, Assistant City Engineer

IN the year 1895 Major Lewis Ginter completed at Richmond, Va., the Jefferson Hotel, which cost something over one and three quarter million dollars. When it was nearing completion that gentleman, with our recently deceased City Engineer, Colonel W. E. Cutshaw, endeavored to find the most suitable paving material for the streets at whose intersection the building stood. The result of their investigation was the adoption of asphalt blocks. In September of that year blocks manufactured by the Washington Asphalt Block and Tile Company, of Washington, D. C., were laid by a local contractor, under the supervision of the manager of the manufacturing company and of the City Engineer.

The blocks, 12 inches long, 4 inches wide and 5 inches deep, were laid on a 2-inch sand cushion and a 5-inch rolled gravel base. After about 12½ years of wear this paving is in first-class condition, the Jefferson street square having had no repairs except where a wall fell on it when the hotel was burned, and the Franklin street square having had fifteen or twenty dollars spent in repairs in that time.

Following the erection of our new City Hall, the city, about July, 1898, paved Broad street in front of that building with the same material, using, however, a 5-inch natural cement concrete base in place of gravel; and after about 9½ years, with no repairs meantime, this street is

in first-class condition, except for the usual ruts worn next to rails of street car tracks, which are found more or less in all pavements. Following this work the city laid four other sections on a 5-inch concrete base, all of which are now from four to nine years old and are in first-class condition, having cost nothing for repairs.

After this the city, on account of lower cost, returned to the use of the gravel or macadam base in place of the concrete, although the City Engineer strongly urged the continuance of the latter as the best policy for all permanent pavements. To still further reduce the cost the committee adopted the plan of laying the block with the 5-inch side down, giving only 4 inches in depth; since which we have laid large quantities of the blocks in this way, with satisfactory results.

The usual construction requires the contractor to excavate 11 inches when the block is laid 4 inches deep, and 12 inches when laid with 5-inch depth, the sub-grade to be neatly dressed to conform to the finished surface of roadway, then thoroughly rolled with a steam roller of not less than 12 tons, after which it is rolled by the city's steam roller, weighing about 21 tons and having a compression on the rear rolls of about 700 pounds per inch of width. If gravel or macadam base is used it is then put on and rolled the same as the sub-base, after which the longitudinal and transverse grades, or crown, are again accurately laid off and marked with pegs, on which board templates are placed for forming the crown of the street. The sand bed is then filled in to a depth of 2 inches and a heavy 16-foot straightedge dragged from curb to curb on these boards until the sand bed is struck smooth and is in a firm condition. On this the blocks are carefully laid, breaking joints with a lap of not less than 4 inches. To secure close joints, a man with a hammer follows up the block layers and taps back the blocks, tightening the joints and keeping them in a straight line. Following this a workman with a crowbar, using it as a lever against the curb, forces the blocks into tight contact at their end joints, and the key (a block required to be at least 3 inches long) is inserted to hold them permanently in place.

After this laying is completed the paving is lightly sanded and rammed twice with 125-pound two-man rammers, an iron plate covering several courses being placed on the blocks, and a third ramming is given the strips next to the curbs and around fixtures where a roller cannot reach. After this a drum roller, weighing about 5 tons, is run over the paving and any defects made good. The entire surface is then grouted with Portland cement and sand, mixed one to one, and is afterward covered with about one-half inch of fine sand. The pavement is left in this condition for a few days to allow the cement to set before opening to the public.

The blocks used for this paving are composed of about 88 per cent. of trap rock, or quartz, crushed to about one-quarter to three-eighths inch in size, with a small percentage of mineral dust to fill the interstices, which, while heated, is mixed with about 12 per cent. of Trinidad Lake asphalt which has been combined

with petroleum residuum or some other softening material. The mass as thus composed is molded into the block under a compression of probably 180 tons to the block, or about 6,000 pounds per square inch.

This paving, for the last two years, has been laid in this city complete on a 5-inch gravel or broken stone base at a cost of \$2.20 per square yard. Previous to that time we had paid about \$2.30 for the same work, and when we laid it on 5-inch hydraulic concrete base it cost us about \$2.75 per square yard. It might be well to say, however, that in almost all cases there has been enough gravel or macadam removed from the streets to form the 5-inch base for the proposed paving, thus lessening the cost of supplying gravel or broken stone.

The advantages of this pavement are its durability, smoothness, freedom from noise (though it is not as noiseless as the sheet asphalt pavements), its imperviousness to liquids, and especially the ease with which it can be removed and replaced by ordinary labor in making surface cuts.

We are using asphalt blocks on one or two streets having about 6 per cent. grades, but the large majority is on streets of much flatter grades. In all we have several miles of this paving.

#### VITRIFIED BRICK PAVEMENT CONSTRUCTION

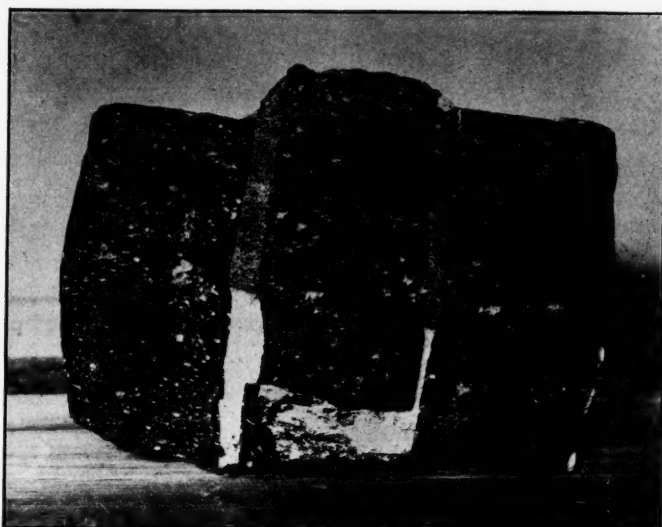
By WILL P. BLAIR, Corresponding Secretary  
National Paving Brick Manufacturers' Association

VITRIFIED brick have been used for more than twenty-five years in this country for paving streets and roadways. In the early commencement of their use for this purpose and for several years afterwards, the manner of construction of such streets received but little attention. They were placed in the street with little consideration for the lasting qualities of the street and much less for the comfort of the user. The convenience and readiness with which they were placed in the street and the fact that they bettered a former condition led to their increased use.

Later a few engineers began to study the problem of brick paving, with regard to their use and their durability. A few samples of good construction attracted the particular attention of some of the manufacturers, and these men, progressive and far-seeing, looking to the future of their business, realized that the greatest possibilities, from a manufacturer's standpoint and interest, lay in making the paving material acceptable to the property owner and user. In other words, it became finally an accepted proposition that well constructed brick streets meant and still mean more brick streets.

As one result of this conclusion there was organized the National Paving Brick Manufacturers' Association, the chief object of which is to secure the best possible construction of brick streets. By watching closely the efforts of the most careful and progressive engineers along this line, and the effects of this method and that method in the continued use of pavements, many ideas of construction have been thoroughly demonstrated as being





SECTION OF BRICK PAVING REMOVED

Shows adhesiveness of cement filler. Brick and filler worn uniformly to a smooth surface on top.

the best possible for fully developing the advantages of this paving material. As a result of this, the association has evolved, from the study of methods and their results, a method of brick pavement construction which secures to municipalities the highest possibilities in brick streets.

The following are the chief causes of the great increase in the use of brick paving:

First: **We believe** the manufacturers have had special regard for the quality of the vitrified brick offered upon the market; at least, this is so with the very great majority.

Second: The adoption in the foundation of the provision that the grade must conform precisely to that of the finished street, whether it be made of concrete, or of a second quality of three-inch vitrified paving blocks.

Third: The use of a sand cushion, upon which the brick of the wearing surface are to be laid, uniform as to fineness and as to the amount of dampness with which it may be charged, two inches in thickness (and the point to be observed as to this cushion is a *uniformity* of thickness), and with its surface corresponding to that of the finished street. Perhaps as many brick streets have been ruined by a departure from this rule as from any other necessary requirement. Many specifications require the use of a one-inch cushion, without considering the physical function and purpose of this cushion. The deflection and vibration caused by the impact upon the brick overlying the cushion must have sufficient relief that the brick will not chip or break; but that relief nevertheless must be a minimum, and not sufficient to cause a break in the bond of the filler.

Fourth: The thorough rolling of the brick, after it has been laid upon the cushion, and the bringing of the surface again to a true and even grade. This rolling and compacting necessarily, if sufficiently done, makes perfectly uniform the cushion underneath by pushing up the surplus sand here and there in the joints between the brick; so that after the rolling a perfect grade is attained.

Fifth: The use of an adequate filler. Of all the steps to be taken in the construction of a brick street the application of the filler seems to be the one point where almost an unlimited number of ingenious ways are resorted to, in spite of the fact that we know of but one filler-cement, and one way for the application of this filler, by which the very best possible results may be obtained. We shall not enter into details in this article as to the method necessary to employ in the application of this filler. They are very carefully laid down in our No. 1 Directions for laying brick street pavements, which may be had free upon application to the Secretary of the Association. Suffice it to say, if the direction is followed and the material used is a good quality of Portland cement and sand, there is no possible chance that the bond will ever break.

Before stating the sixth vital point in the construction of the street, we wish to digress by stating that perhaps the most common objection urged against the use of a brick street (an objection that comes from experience with an improperly constructed street), is the noise caused.



BRICKS REMOVED FROM PAVEMENT

Shows cement filler adhering to bricks. Also filling irregularities on the edges and wearing down uniformly with surface.

The sixth vital point in construction, to meet this objection, is the expansion cushion, provided for the purpose of eliminating the noise that otherwise prevails. This must be arranged for by placing a board from an inch to an inch and a half in thickness (according to the width of the street under construction), along and next to the curb, which shall remain in place until after the street is in all other respects finished; but within twenty-four hours following the application of the cement filler, this board must be removed. We say "must be" because, if you leave it in thirty-six hours, you cannot remove it without very greatly breaking the cement bond formed, or, in fact, will scarcely be able to remove it at all. The space from which the board is removed must be poured two-thirds full with a tar filler. Over this tar filler, and

brought to the level of the top of the brick, sand should be well packed. This expansion cushion does not permit of a possibility of the brick surface (now a unit) pushing against the curb by reason of any expansion that may result from extreme temperature, so that you have the wearing surface as a unit lying thoroughly compacted upon and into a bed of sand, thus practically eliminating the noise, or reducing it to a minimum.

Persons who have never experienced the use of a street built under this method are sometimes persuaded to the use of fillers other than cement; but none of these, however good they may seem upon presentation, accomplishes the purpose sought for, and in other particulars they detract very materially from the best possibilities of a street.

Brick streets thus properly constructed present an anomaly, in that they can be said to provide a street growing slightly better as it grows older, and one without a maintenance charge for a great many years to come.

#### Washington's Pavements

THE importance of the quality of the sand used in asphalt paving has not been fully appreciated by most of our cities until quite recently, and even yet there are comparatively few who pay sufficient attention to this. The fact that the sand requires inspection is indicated by the fact that in Washington, D. C., during the year ending June 30, 1907, the inspector of asphalt and cements rejected 6,300 cubic yards out of 24,450 inspected, or more than one-fourth. The specifications for the sand to be used in the asphalt wearing surface require that it be hard grained and moderately sharp; that at least 15 per cent. should remain on a 40-mesh sieve, 25 per cent. should pass an 80-mesh sieve and 10 per cent. a 100-mesh sieve. If, however, the sand does not contain the desired fine material, mineral dust can be added to make up the deficiency. As the bitumen in the asphalt wearing surface constitutes only 9 to 13 per cent. of the whole, the remainder being sand and mineral dust,

the importance of careful selection of the latter must be apparent.

Another interesting detail in the same report is the difference between tests of samples of a given brand of cement when taken from the work and of samples of the same brand submitted with bids. In no case did the general run of samples come up to those originally submitted. One brand shows a tensile strength of 569, 742 and 344 pounds per square inch for one day neat, 7 days neat and 7 days when mixed with three parts of standard sand, for samples taken from the work, whereas the sample submitted showed 777, 831 and 369 pounds respectively. Another brand showed 551, 717 and 332 pounds respectively as an average of the cement delivered, as compared with 738, 855 and 427 pounds for the sample; and a third brand gives 395, 741 and 304 as against 461, 843 and 351 pounds for the sample submitted. In each case the results obtained from the samples submitted were the mean of 15 tests, while the other results were the average of from 730 to 4,077 tests.

The prices for asphalt block paving during the year were \$1.76 per square yard paved on edge and \$1.60 per square yard paved flat. The prices for 1907 were at \$1.68 and \$1.69 for sheet asphalt, \$1.80 per square yard on edge and \$1.65 per square yard flat for asphalt block. Sheet asphalt in Washington is laid upon a 6-inch foundation of concrete. Asphalt blocks are 5 by 4 by 12 inches and are laid upon a gravel foundation 5 inches thick, when thoroughly compacted, and 2 inches of sand cushion.

There is still a great deal of granite block in Washington which the residents have petitioned to have replaced with asphalt, and this the Commissioners believe should be done, but they have been prevented by Congress from making the change.

During the year 8,744 cuts were made by plumbers and others in the 440 miles of streets in the District, or about 20 per mile. These cuts were distributed as follows:

Cuts Made in Washington, D. C., Pavements

	Number	Square Yards	Cost (Amount Charged)	TOTAL PAVING		Number Per Mile
				Sq. Yards	Miles	
Item No. 1.—Plumbers' cuts:						
Sheet asphalt.....	307	761.40	\$2,284.20	2,798,358	138.26	2.22
Granite block.....	180	329.00	444.15	484,464	25.88	6.96
Asphalt block.....	251	841.66	1,136.24	559,609	26.26	9.56
Vitrified block or brick.....	168	271.20	542.40	22,415	0.92	182.6
Cobble and rubble.....	173	206.00	92.70	184,961	8.15	21.23
Macadam.....	400	183.75	248.05	1,290,570	81.79	4.89
Granolithic walks.....	507	637.04	1,433.33	.....	.....	.....
Brick sidewalks.....	1,494	13,951.90	25,580.76	.....	.....	.....
Item No. 2.—Railroad, electric-light company, telephone company, and other corporations and individual depositors, account of whole cost work..	3,540	17,181.95	11,761.83	.....	.....	.....
Item No. 3.—Various appropriations of the sewer department.....	2,387	46,721.06	69,331.63	.....	.....	.....
Item No. 4.—Various appropriations of the water department.....	438	7,021.20	14,847.06	.....	.....	.....
Item No. 5.—Various appropriations other than the above, including repairs to streets, roads, street lighting, electrical department, improvements and repairs, assessment and permit work, elimination of grade crossings, contingent and miscellaneous expenses, District of Columbia, parking commission, etc.....	1,580	26,241.20	35,848.43	.....	.....	.....
	799	11,689.30	16,235.60	.....	.....	.....
Total.....	8,744	108,854.71	148,024.55	.....	440.04	19.87

a Includes amount charged for paving brick.



## BROOKLYN, N. Y., PAVING NOTES

THE report of the Bureau of Highways of the Borough of Brooklyn, New York, for the year 1906, has just been published and contains some interesting figures, especially concerning the maintenance of pavements. During the year 34½ miles of asphalt and asphalt block were laid, 3¼ miles of granite, 1¾ miles of Medina sandstone and ¼ mile of iron slag blocks. The average price paid for asphalt was \$1.48 per square yard for one-inch of binder and two-inch of wearing surface on a five-inch Portland cement concrete base. For streets with railroad tracks, the average price was \$1.65. Asphalt block was used on streets where the grade exceeded 3½ to 4 per cent. The average price on streets without tracks was \$2.15 and on those with tracks \$2.26. Medina sandstone pavement cost \$3.54 per square yard.

A new material, known as iron slag block, was introduced that year. These blocks are molded at the smelter works from iron slag. The particular blocks used were brought from England. They have been used quite extensively in Canadian cities between street rails and quite a little has been used in Philadelphia also, according to advices received.

The percentage of the various pavements in use in Brooklyn on January 1, 1897, and January 1, 1907, were as follows:

	1897	1907
Asphalt.....	7.42	46.73
Granite.....	21.48	22.00
Cobble.....	50.80	7.77
Belgian Block.....	8.64	6.44
Macadam.....	11.44	15.38
Brick.....	0.22	0.52

Brick reached its maximum total amount in 1902, when there were 5.31 miles in use. In January, 1907, this had been decreased to 3.36 miles. No Medina sandstone was laid prior to 1902; by 1907 5.32 miles had been laid. No modern wood block had been laid prior to 1902 and by 1907 2.15 miles had been laid. The actual amounts of each kind of paving have continually increased with the exception of Belgian block and cobble. The amount of the former has been diminished since 1902; that of the latter since 1888, there having been 307.87 miles that date, which had been reduced to 50.27 miles by 1907.

Repairs on asphalt pavements cost an average of 3½ cents per yard over all area maintained. A larger amount of repairing was done than in previous years because of extra work required on the older pavements, some of which had been down 18 or 19 years and were on a wooden foundation. The total cost of asphalt repairs was \$49,869.84. The prices charged by the Barber Company for this work were 56 cents per cubic foot for top mixture, 25 cents for binder and \$5.25 per cubic yard for concrete.

The cost of maintaining asphalt pavement during the year is shown by the table which appears in the next column.

Table Showing Cost of Maintaining Asphalt Pavements During 1906

Time Out of Guarantee	Sq. Yds.	Total Cost	Cost Per Sq. Yard	Cost per Sq. Yd., Car track Streets Exclud'd	Cost per Sq. Yard, Car track Streets
One year.....	175,936	\$1,468.95	\$0.008	\$0.008	.....
Two years....	57,929	429.17	007	006	\$0.006
Three years...	82,937	365.75	004	003	036
Four years....	421,274	13,301.88	032	027	067
Five years....	189,415	3,212.28	017	017	024
Six years.....	209,937	9,098.90	043	045	016
Seven years...	44,056	1,743.66	039	036	053
Eight years...	41,187	1,406.85	034	034	.....
Nine years....	36,706	1,084.84	054	054	.....
Ten years....	27,410	2,270.31	083	021	128
Eleven years..	5,278	169.70	032	025	130
Twelve years..	29,069	2,577.53	089	100	072
Thirteen years	79,249	8,934.86	113	105	231
Fourteen years	20,504	2,862.72	140	140	.....
Fifteen years..	235	.....	.....	.....	.....
Sixteen years..	3,448	4,244.00	012	012	.....
Total....	1,424,579	\$49,869.84	\$0.0350	\$0.0321	\$0.0630

The number of openings made in streets during the year was 12,143, of which 10,887 were plumbers openings. Of these openings 309 were still unpaved at the time of writing the report, most of them because they were covered with building material in connection with incompleting construction.

The total area of the borough is 38,977.84 acres; of which 24,417.8 are included in the blocks, 11,973.8 are street area, 1,049.7 are in parks, 660.1 in cemeteries, 373.2 in canals and 403.02 in markets, hospitals, etc. It is seen by this that, considering only block and street areas, 32.9 per cent. of this is occupied by streets; and 30.7 per cent. of the entire area is in streets.

## Water Meters in Duluth

IN his Annual Report for 1907, L. M. Case, manager of the water and light department of Duluth, Minn., recommends the further metering of the water supply. Two-thirds of the water sold at the present time is metered; this including all factories, public buildings, saloons, breweries, livery stables, nearly all stores and large residences, flats and quite a large number of families. Experience in Duluth has, he believes, demonstrated that in the case of the medium-sized and smaller premises, the meter rates are less than flat rates; it being no uncommon thing for premises with one bath, closet and a basin, in an eight-room house, to pay 50 cents to \$1.00 a month by meter, where the flat rate would amount to at least \$13.50 annually. There exists, of course, in this city as in others, the argument in favor of meters that they prevent waste. He states that an eminent engineer reported concerning Detroit, after studying conditions there, that meters had been introduced at an average annual expense of \$21,000 during nine successive years, and that the value of the water saved, the difference in the cost of construction being taken into consideration, amounted to five times the cost of the meters, or \$756,000 in the nine years.

## PAVING IN THE UNITED STATES

Data Obtained During the Past Month from Four Hundred and Fifty Cities—Amounts of Paving in Use—Work in Prospect for 1908—Foundations and Fillers Used

THE MUNICIPAL JOURNAL a few weeks ago sent to the City Engineers of all cities of 8,000 population or over, and to the majority of those between 4,000 and 8,000 which were believed to have City Engineers, blanks asking for information concerning street paving, and the information collected by this means is shown in the tables accompanying this article. These tables show the amount of work done during 1907 by each city reporting, the amount of paving in such cities at the present time, and the amount of work in prospect for the present year.

For the purpose of grouping the results the country has been divided into eight sections, the division more or less arbitrary; but the endeavor was, as far as possible, to group together those States whose conditions and problems with reference to paving were similar. These groups are as follows: New England; Middle Atlantic States; South Atlantic States (the States comprising these groups are well known and need not be stated); Ohio Valley, comprising Ohio, Indiana, Illinois, Kentucky and Tennessee; Upper Mississippi-Missouri, comprising North Dakota, South Dakota, Minnesota, Michigan, Wisconsin, Iowa, Nebraska, Missouri, Kansas; Lower Missouri and Gulf, comprising Oklahoma, Arkansas, Alabama, Mississippi, Louisiana and Texas; Rocky Mountains, comprising Montana, Idaho, Wyoming, Utah, Colorado, Nevada, Arizona and New Mexico; and the Pacific Coast, comprising Alaska, Washington, Oregon and California.

The names of cities reporting are given in tables 1 and 2, but a number of those reporting are omitted from table 1 because they have no paving, others from table 2 because none is contemplated for the present year. Those omitted from the table because of having no paving are as follows:

Keene, N. H.; Arlington, Framingham, Newton, Pittsfield, Watertown and Webster, Mass.; Pawtucket, R. I.; Norwalk and Willimantic, Conn. (probably most of these have macadamized streets, which, however, is not considered as paving in New England; Hornell and Port Jervis, N. Y.; Summit, N. J.; Columbia and Sayre, Pa.; Smyrna, Del. (most of these also have macadamized streets); Westminster, Md.; Orangeburg, S. C.; Americus and Griffin, Ga.; Circleville, Hartwell, Sidney and Tiffin, O.; Anderson, Butler and Fairmount, Ind.; Carbondale, Marengo and Rockford, Ill.; Johnstown City, Tenn.; Grand Forks, N. D.; Watertown, S. D.; Albert Lea, Anoka, Owatonna and Moorhead, Minn.; Iron Mountain, Mich.; Ashland and Waukesha, Wis.; Centerville, Eagle Grove, Eldora, Missouri Valley and Storm Lake, Ia.; Fairbury, Falls City, Kearney, Grand Island and Norfolk, Neb.; Clinton, Mo.; Argentine and Holton, Kan.; El Reno, Okla.; Avondale, Bessemer and Sheffield, Ala.; Pocatello, Idaho; Bozeman, Mont.; Laramie, Wyo.; Provo, Utah; Ft. Collins and Grand Junction, Colo.; Raton, N. M.; Bakersfield and Santa Cruz, Cal.

The cities just named, and those appearing in table 1 which do not appear in table 2, were omitted because they gave no figures concerning contemplated paving. In some cases it is not expected that any will be done, but in the greater number the amount and kind of pav-

ing had not yet been decided upon, and in a number of these the city expects to do the work by day labor.

Of all the cities to which blanks were sent, about one-half returned these filled out. The table, therefore, is by no means a complete presentation of paving conditions in the country. It is believed, however, that, aside from the largest cities, most of those which did not report failed to do so because of having little or no paving concerning which to furnish information. Assuming this to be the case with half of them, the table represents approximately three-fourths of the paving of the country. It is thought, moreover, that the averages prepared from these tables report fairly well the conditions over the entire country, even though they do not give the correct totals. That the largest cities are not reported in these tables is, perhaps, not so much to be regretted, since their traffic conditions place them to a considerable extent in a class by themselves. The inclusion of these would have added considerably to the totals of certain kinds of paving, however. Thus, New York contains relatively large amounts of wood block and cobble paving, and Birmingham a considerable amount of bitulithic.

### RELATIVE AMOUNTS OF VARIOUS PAVEMENTS

In New England we find eleven different kinds of paving, aside from macadam. Of these, stone block leads in quantity, and the others arrange themselves in the following order: Gravel, brick, cobblestone, bitulithic, asphalt, Hassam, wood block, asphaltina, asphalt block and bituminous macadam. Last year the largest amount of paving was stone block, followed by Hassam, gravel, brick, bitulithic and wood block in the order given. Bitulithic is the only paving already contracted for this year, stone block the only kind decided upon, and those contemplated are brick, stone block and Hassam.

In the Middle Atlantic States the pavements now in use arrange themselves in the following order of magnitude: Asphalt, brick, stone block, gravel, bitulithic, cobble, asphalt block, asphaltina, slag and wood block. The paving done last year was in the following order: Brick, asphalt, bitulithic, stone block and asphalt block. Work contracted for this year: Asphalt, brick, bitulithic and stone block. The work decided upon, but not yet contracted for: Brick, asphalt, stone block, bitulithic and asphalt block. The work contemplated: Brick, asphalt, asphalt block and stone block.

In the South Atlantic States the paving, arranged in the order of magnitude, is as follows: Brick, stone block, asphalt block, bitulithic, asphalt and wood block. Work done in 1907: Brick, bitulithic, asphalt block, Hassam, stone block, wood block, asphalt and bituminous macadam. Work contracted for: Stone block, brick, bitulithic and asphalt. Work decided upon: Brick and stone



block. Work contemplated: Brick, wood block, bitulithic, stone block and asphalt block.

In the Ohio Valley district the amount of brick paving exceeds that of all other kinds combined (excepting macadam. The others, in order, are: Gravel, stone block, asphalt, bitulithic, asphalt block and wood block. Of work done last year, brick constitutes more than 80 per cent., the other kinds, in order, being asphalt, asphalt block and bitulithic. Of the work contracted for this year, brick constitutes over 90 per cent., with a little asphalt, asphalt block and one contract of Westrumite macadam. Of the work decided upon and contemplated, brick again constitutes more than 90 per cent., asphalt coming next, stone block next, then bitulithic and asphalt block.

In the Upper Mississippi-Missouri district brick forms more than one-half of the paving and asphalt comprises much the greater part of the remainder, the other kinds, in order, being: Wood block (probably much of this is old cedar block), stone block, gravel, bitulithic, asphalt block, bituminous macadam, cobble and concrete. Of the work done last year a little less than one-half was brick, and asphalt was a close second, followed in order by wood block, bitulithic, gravel, concrete and stone block. Of the work contracted for this year brick comprises almost three-fourths, with wood block second, and asphalt, bitulithic, bituminous macadam and Hassam in the order named.

In the Lower Mississippi and Gulf district brick, bitulithic and asphalt are the most popular pavements, with stone block, rock asphalt, gravel, cobble and bituminous macadam following. Of the work done last year, brick formed about 15 per cent., asphalt about 18 per cent., bitulithic 18 per cent. and rock asphalt 18 per cent. Of the work contracted for this year, asphalt leads, with brick a close second and bitulithic third.

In the Rocky Mountain district asphalt leads most decisively, and following in order are gravel, stone block, wood block, bitulithic, brick and slag macadam. Of the work done last year, gravel leads, with bitulithic, wood block, slag, macadam, brick, stone block and asphalt in the order given. Of the work contracted for this year, asphalt forms about 60 per cent., with bituminous macadam second and stone block third; while of the work contemplated, but not yet contracted for, gravel leads, with concrete next, then wood block and stone block.

On the Pacific Coast asphalt forms about 75 per cent. of the paving, with bitulithic and bituminous macadam forming most of the remainder, there being a small amount of brick and stone block. The work done last year was almost all asphalt and bituminous macadam. A large part of the work contracted for this year was asphalt, there being, however, about 4 1-3 miles of brick contracted for and the same amount decided upon.

The comparison of these quantities could not be made exactly because of the fact that certain cities reported miles of street only and others square yards of pavements only. Where figures for both are given in the tables they are to be combined to give the total amount of pav-

ing—that is, the same pavement is not included in both the "miles" and "square yards" columns. In order to obtain the figures under the column headed "total equivalent miles" it was assumed that one mile of pavement is equal to 18,000 square yards, which is, we believe, a very fair average of the ratio to be found in most cities and villages.

#### CONSTRUCTION DETAILS, BRICK PAVING

The foundations used for brick paving in the various districts, so far as they were reported, were as follows: In New England, nothing but concrete. In the Middle Atlantic States twenty-nine reported cement concrete, mostly 6 inches thick; six, macadam; nine, gravel; two, slag; one, sand, and one, ashes. In the South Atlantic States concrete was reported in six cases, macadam in two cases, sand in two cases and gravel in one. In the Ohio Valley concrete was used in thirty-eight cases, macadam in fifteen cases, gravel in eleven cases, sand in five cases, cinders in two cases. In the Upper Mississippi-Missouri district concrete was used in twenty-nine cases, macadam in nine cases, sand in five cases, brick laid flat in four cases, gravel in one and cinders in one. In the Lower Mississippi and Gulf concrete was used in six cases and brick laid flat in one. In the Rocky Mountain district concrete was used in the only city reporting, and the same is true of the Pacific Coast.

The filler used in brick pavement in New England was cement in seven cases, sand in one and pitch in one. In the Middle Atlantic States cement was used in twenty-three cases, sand in seventeen cases, pitch, asphalt or tar in eight cases and ashes in one. In the South Atlantic States sand was used in five cases, cement in seven cases and pitch in one case. In the Ohio Valley cement was used in forty cases, sand in twenty cases and tar or asphalt in fourteen cases. In the Upper Mississippi-Missouri cement was used in nineteen cases, sand in twenty cases and asphalt or tar in six cases. In the Lower Mississippi and Gulf cement was used in five cases, sand in one and asphalt in one. In the Rocky Mountain district cement grout was used in the only city reporting, and on the Pacific Coast sand was used in the one city reporting from there.

#### BRICK PAVEMENT GUARANTEES

The guarantee called for was five years from each of the New England cities reporting. In the Middle Atlantic it was 1 year in six cases, 2 years in one case, 3 years in one case, 5 years in nine cases, 8 years in one case, 9 years in another, and 10 years in two cases. In the South Atlantic States 2 years' guarantee was required in one case, 5 years in five cases and no guarantee in two cases. In the Ohio Valley 1 year guarantee was required in eight cases, 2 years in six cases, 3 years in five cases, 5 years in twenty-four cases, 10 years in four cases, 6 months in one case and no guarantee in another. In the Upper Mississippi-Missouri 1 year guarantee was required in seven cases, 2 years in four cases, 5 years in nine cases, 7 years in two cases, 8 years in one case, 10 years in two cases, no guarantee in seven cases, and in four cases the pavement was laid by the city. In the



## TABLE NO. 1

PAVING IN USE IN THE UNITED STATES With Cost and Details of Construction

Kinds and Amounts Constructed in 1907, and in Service at This Date.

in these tables letters are used to designate paving, as follows: a, Brick; b, Asphalt; c, Asphalt block; d, Cobble; e, Granite; f, Granite block; g, Granite setts; h, Granite setts; i, Granite setts; j, Granite setts; k, Granite setts; l, Granite setts; m, Concrete; n, Bitulithic on old cobble foundation; p, Mosaic block; r, Shell; s, Rock asphalt; t, Slag macadam; v, Miscellaneous; w, Westchester; x, Westchester; y, Westchester; z, Westchester.																			
NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT			NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT		
	Miles	Sq. Yds.	Cost				Miles	Sq. Yds.	Cost		Miles	Sq. Yds.	Cost				Miles	Sq. Yds.	Cost
NEW ENGLAND:										Providence, R. I.									
Augusta, Me.	7.5g		\$34,000				2.5d	35,000g		Woonsocket, R. I.									
Bangor, Me.	None						0.5d	15,500g		Bridgeport, Conn.									
Gardiner, Me.	"						1.5d	11,750g		Bristol, Conn.									
Lewiston, Me.	"						3.0d	6,000h		Danbury, Conn.									
Keene, N. H.	"						0.35d	14,020g		Derby, Conn.									
Nashua, N. H.	0.8g		3,778				0.36f	220,000g		Meriden, Conn.									
Barre, Vt.	0.0g		7,850																
Rutland, Vt.	None																		
Arlington, Mass.	0.9d		17,520d	Gravel			3.573a	53,15b		New Britain, Conn.									
Cambridge, Mass.	0.18e		5,512e	3.24 Plank			8.959d	22,329f		New London, Conn.									
	0.33f		12,138e	2.35 Cr. stone			0.93b	233.3h											
	0.395g		21,670h				12.77d												
	0.59j		9,240i	29,426 Stone & cind															
Fall River, Mass.	0.02h		23,528g	1.149			2.08a	12,823b		Norwich, Conn.									
	0.02h		233.3h	443			12.938c			Waterbury, Conn.									
	0.09a		11,539a	2.26			2.64d	15,549e											
Holyoke, Mass.	0.09e		1,383e	3.31 4" Port. con.			10.75g												
	1.41g		27,124g	0.53			14.427i												
	0.9d		13,076d	Con. or sand															
Lawrence, Mass.	1.53g		26,181g				25.53g	6,707b		MIDDLE ATLANTIC:									
	0.097d		2,122d	Concrete			102.005d			Albany, N. Y.									
Lowell, Mass.	2.58g		38,639g	30.751			1.93b	3,844a											
	0.137h		3,408h	5.939			15.53u	4,067b											
	1.0g		14,000g	0.60			32.15e	3,406h											
							18.00g	250,000g											
Marlboro, Mass.	0.58g		4,755g	Gravel			8.0g												
Natick, Mass.	0.5g		5,650f	Concrete			5.0g	10,976i		Allentown, Pa.									
Newburyport, Mass.	0.321		16,950				9.04k	10,976i											
New Bedford, Mass.	1.70g		22,900g	11.450			0.779b	10,871b											
							13.20k	10,871b											
							41.30f	41,300f											
							41.30f	41,300f											
							41.30f	41,300f											
							41.30f	41,300f											
							41.30f	41,300f											
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							41.30f	41,300f											
							41.30f	41,300f											

NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT		NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT	
	Miles	Sq. Yds.	Cost				Miles	Sq. Yds.		Cost	Miles	Sq. Yds.					
Middletown, N. Y.		5,000a	\$2,56*		6" concrete.		2.25a		Harrisburg, Pa.	0.02a	709	\$3,355	6" concrete.	Cem. grout.	5 years.	2.58a	7,995c
Ogdensburg, N. Y.		7,479g					14.0g	5,272a		8.77b	147,917	325,000	6" concrete.		5 years.	27.5b	3,000e
Olean, N. Y.							3.35a		Hazleton, Pa.	39.70a	1,200a	2.20	6" concrete.	Cem. grout.	5 years.	0.9a	7,255f
Rochester, N. Y.	13.05a	234,000	2.10		6" concrete.	9 years.	61.24b		Jenkintown, Pa.	61.24b	4,18a	3,298	6" concrete.	Cem. grout.	5 years.		
	3.38b	57,200	1.95		6" concrete.	10 years.	12.46i			12.46i	14,661	6,156	Gravel.	Sand			
	1.00i	30,000	3.00		6" concrete.	10 years.	1.00f		Mealville, Pa.	1.00f	1,400g		5" concrete.	Asphalt.	1 year.		
	2.10g	30,000	2.62			10 years.	29.57g			29.57g	29,131			Asphalt and cem. grout.	3 years.	8.94a	
Solvay, N. Y.	0.27f	3,451	1.15			None.	24.53f									0.61c	
Syracuse, N. Y.	1.33a	35,401	66,667		6" concrete.	10 years.	21.50a		Meyersdale, Pa.	21.50a	5,862a	7,962	Br. stone.	Ashes.		19,680a	
	1.46b	16,767	75,655		6" concrete.	10 years.	34.49b		Milton, Pa.	34.49b	14,000a	18,101	Gravel.	Sand	2 years.	1.5a	24,000
	0.21f	718d			6" concrete.	10 years.	3.767f		Nanticoke, Pa.	3.767f	6,037	45,000	6" concrete.	Cem. grout.	5 years.	0.85a	15,000
Tarrytown, N. Y.					Br. stone.	10 years.			New Brighton, Pa.		30,000	15,000	6" concrete.	Sand	1 year.	8.0a	250,000
Troy, N. Y.					6" concrete.	5 years.	14.88a		Norristown, Pa.		7,500			Asphalt.		4.75a	
					6" concrete.	5 years.	7.861c								0.5c		
					6" concrete.	10 years.	25.861								3.7d		
					6" concrete.	5 years.	53.543g								3.6f		
					6" concrete.	10 years.			Oil City, Pa.	0.35a	4,405	8,193	5" concrete.	Sand		12.5g	7,400b
Utica, N. Y.	4.23b	64,455	2.92		6" concrete.	10 years.	54.52b	7,695a	Pittsboro, Pa.	54.52b	2,910a	3,768	Br. stone.	Cem. grout.	5 years.	1.5a	
					6" concrete.	10 years.	5.234d	887c	Pittston, Pa.	5.234d	2,400a				2.5b		
					6" concrete.	10 years.	0.913g	1,849e							0.5d		
					6" concrete.	5 years.	0.704k		Pottstown, Pa.	16,578a	15,497	32,551	6" slag.	Cem. grout.	5 years.	39.100a	
Watertown, N. J.	0.23a	4,800	10.001		6" concrete.	5 years.	19.559a		Scranton, Pa.	19.559a	49,447b	18,276f	Concrete.	Cem. grout.	5 years.		
Bayonne, N. J.	0.22b	4,013	9,709		6" concrete.	10 years.	14.815a			14.815a	13,491	39,657	Br. stone.	Cem. grout.	5 years.		
	0.13e**	2,300	3,001		6" concrete.	10 years.	62.250d			62.250d							
Burlington, N. J.	None.	5,000	7,457		Telford		11.528e		Shamokin, Pa.	11.528e	450g	1,500	Stone.		3.0a	1,000b	
Camden, N. J.	All kinds	73,330	150,000		Concrete.	1.4c	7.800a		Shippensburg, Pa.	7.800a	2,500g	3,975	Stone.		1.0g		
	a	183-	1.83-		Concrete.	66.695	All kinds		Slatington, Pa.	All kinds	40,171	29,746	6" concrete.		9 years	80,571	
	b		2.10		Concrete.				S. Bethlehem, Pa.		10,820		Br. stone.	Sand	5 years	1.13a	19,820
	d		3.04		Sand				Sunbury, Pa.		31,800	46,746	Br. stone or gravel.	Sand	1 year.	7.9a	666b
	d		2.25		Concrete.				Tamaqua, Pa.		3,000f	6,630	1" concrete.		2,333d	2333d	
	e		1.08		6" Telford.		176.000	14,750a	Titusville, Pa.	0.75a	7,000	12,000	1" concrete.	Asphalt.	5 years.	15.463f	25,000b
East Orange, N. J.	2.6g	36,620	51,625			1 year.	57.0g		Warren, Pa.	1.25b	25,000	51,000	1" concrete.	Tar.	5.0a	5,600	
Gloucester, N. J.						None.	10.06g		Wilkesburg, Pa.	0.64a	1,00a	231	1" concrete.	Sand	None.	2.5a	15,000c
Hoboken, N. J.	0.37d	5,800	1.20-		Sand	None.	4.80b	8,700g			9,437	13,211	8" gravel.		21.0a		
			1.79			5 years.	16.60f		Williamsport, Pa.		3,000a	6,000	6" concrete.	Cem. grout.	None.	0.2c	
Jersey City, N. J.	1.67b	29,082	54,608		6" concrete.	5 years.	23.71b								1.0d		
	1.81d	24,448	70,167		6" sand	9 mos.	77.39d		Williamsport, Pa.						5.99a		
	0.41g	8,046	19,380			5 years.	17.74g		Wilmering, Pa.						3.15b		
						None.	0.10a								0.05d		
Long Branch, N. J.	2.0l	30,000	10,000		Telford	None.	3.0b	1,500a			132a	180	Gravel.	Sand			
Montclair, N. J.	1.75g	4,014a	10,000		6" concrete.	1 year.	50.4+g	70,000g			430d	752	Gravel.				
Passaic, N. J.	1.325g		18,610		Trap rock.		29.40g										
Plainfield, N. J.	1.25a	9,000a	22,848		5" concrete.	5 years.	44.5g				37,354	2.20	Concrete.	Cem. grout.	5 years.	8.7a	35,109e
	0.35t		050			1 year.	0.0t				10,862	1.80	Concrete.		5 years.	0.68b	80,475f
		808a	1,657		1" concrete.	5 years.	10.00a				36,743	2.26	Concrete.	Cem. grout.	5 years.	16.88c	25,770p
Trenton, N. J.	1.978b	3,445	9,980		6" concrete.	1 year.	1,43b,c				5,145	3.65	Concrete.	Sand	5 years.	43.92d	
	2,155d	9,492	4,992		Sand	1 year.	1,223e				15,997	3.20	Concrete.	Pitch & grout	5 years.	54.25g	
	5,745g	9,492	4,992		Sand	1 year.	3.79d	55,003g			41,326	2.24	Br. stone.		2 years.		
	5,342	103,382	103,382		Concrete.	1 year.	9.24b	26,208a	Cumberland, Md.		39,987	56,224	Br. stone.	Cem. grout.	2 years.	8.5a	
Allentown, Pa.	2.56b					5 years.	8.84g	29,733f	Clifton Forge, Va.		34,081	10,000g	Br. stone.		*		
						None.	15.0g		Phoebus, Va.		25,470h					16.000g	
Clearfield, Pa.	1.25a	26,200	1.55		8" macadam.	5 years.	8.84g	29,733f								13,800a	8,600c
Connellsville, Pa.	1.045a	500a	2,310		Sand	None.	15.0g	61,600a							250d	25,800g	
Danville, Pa.	1.96	45,000a	1.96		gravel	5 years.	15.000a		Roanoke, Va.	3.06a	67,943	2.20	Concrete.	Cem. grout.	5 years.		
Derranccon, Pa.	13,184	2.24	6" concrete.		Sand	5 years.	31.034a			0.71d	10,493	2.25	Sand	Sand			
Easton, Pa.	a				6" concrete.	5 years.	34.0g	59,416a		2.24g	39,381	0.67					
East Pittsburg, Pa.	22,104	9,626	1.45		Sand with gravel or slag	1 year.			Elkins, W. Va.	0.41j	7,118	19,008	Cinder.	Sand			
	13,880								Farmount, W. Va.	0.75a	13,200	15,692	Sand		12.0a	15,300c	
Franklin, Pa.	17,550	7,550	1.82		8" gravel	5 years.	64,000a		Huntington, W. Va.	2.2a	63,000	12,945	Sand		8.8a	15,300c	
Greensburg, Pa.	1.25a	24,000	83,473		Concrete.	5 years.	9,000a			0.3c	5,300	14,050	8" gravel	Sand		12.53a	5,333c
Greenville, Pa.	3.6a	57,288			Macadam	5 years.	10.1a	47,520a	Parkersburg, W. Va.	0.33c	1,944a	1.05	Cinders.	Sand	5 years.	10,000a	



# PAVING IN USE IN THE UNITED STATES

## Kinds and Amounts Constructed in 1907, and in Service at this Date. With Cost and Details of Construction

In these tables letters are used to designate paving, as follows: a, Brick; b, Asphalt; c, Asphalt block; d, Stone block; e, Wood block; f, Bitulithic; g, Macadam; h, Hassam; i, Asphaltina; j, Bituminous macadam; k, Cobble; l, Gravel; m, Concrete; n, Bitulithic on old cobble foundation; p, Mosaic block; r, Shell; s, Rock asphalt; t, Slag macadam; v, Miscellaneous; w, Westrumite macadam; x, Not stated; y, Not decided upon.

NAME OF CITY	WORK DONE			NAME OF CITY	WORK DONE			KIND OF FILLER USED	GUARANTEE REQUIRED	TOTAL AMOUNT IN CITY AT PRESENT	
	Miles	Sq. Yds.	Cost		Miles	Sq. Yds.	Cost			Miles	Sq. Yds.
Wheeling, W. Va.	0.77a	12,723	\$15,964	Niles, O.	0.39c	7,238	\$17,269	Br. stone	5 years	2.46c	37.0g
Asheville, N. C.	0.34g	6,000	4,500	Norwood, O.	3.27g	90,000	90,000	Sand	1 year	3.70g	0.25a
	3.10f	42,784	2.00		0.3a	35,592	2.09	6" concrete	2 years	0.75b	4.0a
Elizabeth City, N. C.				Oberlin, O.	1.9a	35,592	2.09	6" concrete	2 years	0.1c	3.96a
Salisbury, N. C.				Painesville, O.	0.8a	7,100	1.85	6" concrete	6 mos.	5.0a	40,000c
				Sandusky, O.	0.8a	7,100	1.85	6" concrete	5 years	10.67a	18,623b
Wilson, N. C.				Springfield, O.	0.8a	12,485	27,492	6" concrete	5 years	14.39g	297c
Anderson, S. C.	0.5g	5,700	7,777	Toledo, O.	5.67a	86,775	184,312	Br. stone	5 years	94.94a	128,503e
Greenville, S. C.					1.24b	19,416	38,707	Concrete	10 years	15.31b	34,933f
Albany, Ga.					0.61f	11,936	28,572	Br. stone	5 years	9.1c	154,195g
Columbus, Ga.				Warren, O.	0.83g	10,977	2,457	Slag	5 years	3.18a	4,332d
Valdosta, Ga.	0.25a	7,000	10,710	Wausau, O.	0.2g	2,129	7,775	Concrete	5 years	3.34c	11,994g
St. Augustine, Fla.				Wellston, O.	0.75a	15,000	17,000	8" gravel	2 years	2.5a	2.5a
					0.81a	14,080	15,532	Br. stone	1 year	8.3a	2.5g
OHIO VALLEY:				Attica, Ind.	0.81a	14,080	15,532	Br. stone	1 year	4.94a	15,000a
Akron, O.	0.15a	37,464	66,742	Auburn, Ind.	8.011b	11,876a	21,183	5" concrete	10 years	38,124b	38,124b
Ashtabula, O.	1.60c	26,363	3,994	Bloomington, Ind.	1.25g	10,800	8,400	5" concrete	3 years	28.0g	55,270a
				Brazil, Ind.	1.25a	20,000	2,000	Asphalt	5 years	6.5a	6.5a
Berea, O.				Brookville, Ind.	0.75b	12,714	2,13	6" concrete	7 years	54.0l	7,000a
Bucyrus, O.	1.3a	22,000	41,400	Columbus, Ind.	6.00c	6,000c	6,000c	Gravel	2 years	38,388b	38,388b
Cambridge, O.	2.12a	37,052	2,098	Connersville, Ind.	8.479a	13,944a	12,915	Br. stone	2 years	33,675a	33,675a
				Decatur, Ind.	2.4b	24,379g	24,379g	Macadam	3 years	26,370a	26,370a
Chillicothe, O.	0.24a	4,601	1.62	Elkhart, Ind.	5.7g	16,913	29,794	Br. stone	10 years	23,111f	23,111f
Cleveland, O.	26.8a	400,000	876,945	Fort Wayne, Ind.	0.54g	9,942	17,793	6" concrete	10 years	9,942g	9,942g
	1.4b	21,100	64,594	Garrett, Ind.	3.43b	61,083	14,831	6" concrete	10 years	16.0a	4,268c
	1.3d	20,440	82,568	Hammond, Ind.	0.17a	3,188	6,401	Br. stone	10 years	27.0b	61,596a
	0.2j	3,400	9,080	Huntington, Ind.				6" concrete	10 years	8,300c	8,300c
Columbus, O.				Kendallville, Ind.				6" concrete	10 years	6,063e	6,063e
				Marion, Ind.				6" concrete	10 years	2.5a	2.5a
				Michigan City, Ind.				6" concrete	10 years	16.5g	22,000b
				Mishawaka, Ind.				6" concrete	10 years	15.00f	15,000f
				Muncie, Ind.				6" concrete	10 years	13,000g	13,000g
				Perry, Ind.				6" concrete	10 years	7.0a	7.0a
				Richmond, Ind.				6" concrete	10 years	6.0l	6.0l
				Shelbyville, Ind.				6" concrete	10 years	2.5a & b	2.5a & b
				South Bend, Ind.				6" concrete	10 years	30.00a	30.00a
								6" concrete	10 years	12.56a	62,600b
								6" concrete	10 years	6.75g	6.75g
								6" concrete	10 years	56.37g	68,640b
								6" concrete	10 years	25.0g	40,000a
								6" concrete	10 years	1.52a	1.52a
								6" concrete	10 years	13.0g	13.0g
								6" concrete	10 years	0.2m	0.2m
								6" concrete	10 years	5.00a	5.00a
								6" concrete	10 years	41.0a	10,620g
								6" concrete	10 years	4.75b	4.75b



NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT		NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT	
	Miles	Sq. Yds.	Cost				Miles	Sq. Yds.		Miles	Sq. Yds.	Cost				Miles	Sq. Yds.
South Bend, Ind.	0.06	7,741	\$1,260	6" concrete.	Cem. grout.	5 years.	19.02	56,000	Red Wing, Minn.			6" concrete.	Cem. grout.	5 years.	1.88		
Terre Haute, Ind.		113,270	1.84				16.5g		Stillwater, Minn.								0.17a
Valparaiso, Ind.	8.0g	29,747	43,500	Macadam.	Sand	2 years.								0.16d			
Wabash, Ind.		876a	72,000	6" concrete.	Cem. grout.	5 years.	0.25a		Adrian, Mich.					5.5a			
Winchester, Ind.	0.77	20,850	3,449g	Concrete.	Cem. grout.	5 years.	1.33b	24,612						10 years.			
Belleville, Ill.	1.17g	50,000	16,300	4" concrete.	Cem. grout.	5 years.	1.17g	34,350	Alpena, Mich.					0.2g			
Blue Island, Ill.	4.0a	20,280	1.78	6" concrete.	Cem. grout.	5 years.	15.0a		Ann Arbor, Mich.					0.64k			
Champaign, Ill.	1.25a	26,495	46,102	6" concrete.	Cem. grout.	5 years.	2.0a		Battle Creek, Mich.					1a			
Danville, Ill.	2.25a	18,155	1.61	Concrete.	Cem. grout.	None.	16.5a		Bay City, Mich.								
Decatur, Ill.			42,185	Concrete.	Cem. grout.	5 years.	30.0a										
					asphalt.	5 years.	6.0b										
Dixon, Ill.		11,000g	3,560				2.0f		Benton Harbor, Mich.								
	4.0a	82,807	138,000	6" concrete.	Cem. grout.	1 year	32.8a		Big Rapids, Mich.								
East St. Louis, Ill.	0.06a	464	788	Gravel.	Sand	5 years.	3.01		Detroit, Mich.								
Elgin, Ill.	0.46a	10,648	23,826	Concrete.	Sand	5 years.	3.49a										
Freeport, Ill.	0.5b	10,508	20,559	Concrete.	Sand	5 years.	38,544g										
Granite City, Ill.	2.0a	27,000	1.45	Br. stone.	Sand	5 years.	25.0a		Escanaba, Mich.								
Kankakee, Ill.	1.30a	30,488	59,360	Macadam.	Cem. grout.	None.	63,601a		Grand Rapids, Mich.								
	1.30a	5,000a	1.85	Concrete.	Asphalt.	None.	1.0a										
Kewanee, Ill.		1,405a	2,400	4" concrete.	Sand	None.	40.0g										
	0.6a	15,000	22,000	Concrete.	Cem. grout.	None.	12.3a										
Mattoon, Ill.	0.73a	12,920	1.45	Br. stone.	Sand	1 year	8.4a		Hancock, Mich.								
Mt. Vernon, Ill.	1.5a	24,000	1.50				5.5a										
Oak Park, Ill.	0.5a	7,478	14,358	Macadam.	Cem. grout.	5 years.	2.47a		Lansing, Mich.								
	0.75b	37,570	3,38b	Concrete.	Sand	5 years.	3.38b		Monroe, Mich.								
	1.5g	33,083	43,000			2 years.	2.47e		Muskegon, Mich.								
Paris, Ill.		35,725a	65,167	Concrete.	Cem. grout.	None.	35.54g		Negaunee, Mich.								
Rock Island, Ill.		6,600a	1.85	6" concrete.	Sand	5 years.	8.6a		St. Joseph, Mich.								
	3.02a	60,839	108,637	6" concrete.	Sand & asphalt	5 years.	39.52a		Saginaw, Mich.								
Springfield, Ill.	1.39b	24,313	51,597	6" concrete.	Sand	None.	90,630b										
Sterling, Ill.		16,580a	16,580	Br. stone.	Sand	5 years.	10.0g		Three Rivers, Mich.								
Streator, Ill.		20,775a	49,514	Cinders.	Sand	5 years.	20.0a		Appleton, Wis.								
Waukegan, Ill.	0.2a	1,860	6,476	Concrete.	Sand	1 year	51,499a										
	0.2g	2,500	2,425	Concrete.	Cem. grout.	5 years.	18,933g										
Ashland, Ky.	2.25a	50,000	1.50	Gravel.	Tar	1 year	8,500a										
Bellevue, Ky.		500a		Concrete.	Cem. grout.	5 years.	11.0a										
Covington, Ky.	2.0a			Concrete.	Cem. grout.	5 years.	3.3b		Baraboo, Wis.								
							30.0g		Beloit, Wis.								
Frankfort, Ky.									Chippewa Falls, Wis.								
Glasgow, Ky.									Eau Claire, Wis.								
Palucah, Ky.							46.61										
Harriman, Tenn.		19,888a	2.12	6" concrete.	Cem. grout.	5 years.	3.0g										
Nashville, Tenn.	2.23g		0.537				1.1327		Pt. Atkinson, Wis.								
	7.43g		0.495*				0.11g		Janesville, Wis.								
	3.3g	30,976	1.28*	Gravel.			2.0a		Kenosha, Wis.								
							126.180d		La Crosse, Wis.								
							116.669f										
Union City, Tenn.							4.0g										
									Neenah, Wis.								
							0.50g										
							63,977a		Portage, Wis.								
									Racine, Wis.								
Upper Mississippi-South:																	
Aberdeen, S. D.	1.5a	31,000e	91,000	5" concrete.	Tar	10 years.	31.000e										
Deadwood, S. D.		16,875	74,657	1" concrete.	Sand	None.	16,875										
Sioux Falls, S. D.		6,336m	12,180	1" gravel.		10 years.	31,104a										
Austin, Minn.		14,940a	28,685	6" concrete.	Cem. grout.		18,863b										
Crookston, Minn.							3.79f										
							18,863b										
							23,836g										
Little Falls, Minn.							10,652a										
Mankato, Minn.							25,450a										
							17,000b										

# PAVING IN USE IN THE UNITED STATES

In these tables letters are used to designate paving, as follows: a, Brick; b, Asphalt; c, Asphalt block; d, Stone block; e, Wood block; f, Bitulith;c; g, Macadam; h, Hassam; i, Asphaltina; j, Bituminous macadam; k, Cobble; l, Gravel; m, Concrete; n, Bitulithic on old cobble foundation; p, Mosaic block; r, Shell; s, Rock asphalt; t, Slag macadam; v, Miscellaneous; w, Westrumite macadam; x, Not stated; y, Not decided upon.

NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT		NAME OF CITY	WORK DONE			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN CITY AT PRESENT	
	Miles	Sq. Yds.	Cost				Miles	Sq. Yds.		Cost	Miles	Sq. Yds.					
Watertown, Wis.							2.0a		Manhattan, Kan.	0.66a	13,382	\$19,538	Brick.	Sand	2 years.	31,068g	
Boone, Ia.	0.55a	12,840	\$20,030	5" concrete.	Cem. grout.	1 year	3.0g		Ottawa, Kan.	1.99a	23,543	57,449	Cinders.	Sand	None.	81,278a	
Cedar Falls, Ia.	1.10a	15,523a	26,046	Macadam	Sand	1 year	5.27a		Pittsburg, Kan.	0.34a	42,527	1,274	Brick.	Sand	2 years.	96,613a	
Cedar Rapids, Ia.		25,308	1.48	6" macadam.	Sand	None.	19.30a	45,000	Topeka, Kan.	6.761	1.10***	Concrete.	Asphalt.	2 years.	33,86a		
							2.94b								3.50d	13,053R	
							5.15g		LOWER MISSISSIPPI AND GULF:								
Clinton, Ia.	1.82a	1,500a	1.74	4" concrete.	Sand	1 year	50.0g	340,000	ARMORE, OK.	2.5S	52,000	2,270	6" concrete.	Cem. grout.	10 years.	52,000	
Council Bluffs, Ia.	3.44a	36,945	75,787	Concrete and brick.	Cem. grout.	1 year	21.60a		End, Ok.	2.0a	5,500	14,000	6" concrete.	Cem. grout.	5 years.		
Davenport, Ia.	4.14b	77,427	76,946	5" concrete.	Sand	7 years.	38,98a	1,265e	McAlester, Ok.		67,200b	183,000	6" concrete.	Asphalt.	10 years.	15,000	
							7.91b	9071			5,000a	10,000	Brick.		None.		
Dubuque, Ia.	1.5a	35,350	73,813	Concrete.	Concrete.	1 year			Wagoner, Ok.	2.75a	80,000g	316,000	Concrete.	Cem. grout.	5 years.	80,000g	
	0.5g	5,809	7,227	Telford	Sand	1 year	7.50b	40,000a	Little Rock, Ark.	2.25b		15,000	Concrete.	Cem. grout.	5 years.	6,11a	
Fort Dodge, Ia.	0.7g	2,057a	1.94	4" concrete.	Sand	1 year	27.5g			1.5g			Concrete.		0.73d		
Greenwood, Ia.				Br. stone.		1 year	1.4g		Pine Bluff, Ark.				Concrete.	Sand	None.	37,800l	
Keokuk, Ia.							8.4a	11,000b	Decatur, Ala.	1.000a	18,840b	2.20	6" concrete.			1,000a	
Marshalltown, Ia.							1.25a	64,400b	Montgomery, Ala.	1.5x	40,000	23,000	Concrete.	Asphalt.	10 years.	23,000a	
Mason City, Ia.							15.0a	24,000b	Jackson, Miss.	0.94a	23,000	6,86c	Gravel.		5.45d	7,820k	
Muscatine, Ia.							10.36a	16,122c	Natchez, Miss.	0.85g	11,611	2.06	6" concrete.	Cem. grout.	*		
Oelwein, Ia.				Concrete.	Sand		5.19a	52,188g	Vicksburg, Miss.		9,932a	11,150	Concrete.	Cem. grout.	5 years.	41,340a	
Oskaloosa, Ia.							8.45b		Beaumont, Tex.		96,293f	256,908	Concrete.	Cem. grout.	10 years.	121,326b	
Sioux, Ia.							3.52e		Dallas, Tex.		2,312a	1.95	Concrete.	Cem. grout.	260,000f		
							22.0a8b		Denison, Tex.								
Waterloo, Ia.	1.82a	8,370a	2.10	5" concrete.	Cem. grout.	7 years.			ROCKY MOUNTAINS:								
	1.39b	103,263b	1.81	5" concrete.		1 year	18.42a	142,777a	Boise, Ida.	1.0a	5,838	3,75	Concrete.	Cem. grout.	10 years.	13,393a	
Beatrice, Neb.							10.31b			1.5f	39,452	2.28				49,680b	
Lincoln, Neb.							1.37e									30,452f	
							2.5a	5,800l								14,660g	
North Platte, Neb.							3.0g		Anaconda, Mont.	0.5g	14,667	40,000			0.5g		
York, Neb.							5.0l		Butte, Mont.		4,500d	30,125	Concrete.	Sand	None.	77,000d	
Brookfield, Mo.							3.0l		Great Falls, Mont.	0.42e	15,900	64,180	5 1/2" concrete.		31,200e	825e	
Girardeau, Mo.							5.0l		Cheyenne, Wyo.		550d	3,83	5" concrete.	Cem. grout.	7 years.		
De Soto, Mo.																	
Hannibal, Mo.	0.85a	7,000a	14,600	8" macadam.	Sand	None.	10,557g		Anaconda, Mont.								
Kansas City, Mo.	16.82b	10,802	19,275	Concrete.	Cem. grout.	8 years.	41.77a	46,500a	Butte, Mont.								
		290,084	480,513	Concrete.		10 years.	179,63b	19,621f	Great Falls, Mont.								
	2.91g	46,090	45,780				31.39g	7,087e	Cheyenne, Wyo.								
Lexington, Mo.									Ogden, Utah.								
Macon, Mo.	0.75a	13,200	6,600	Macadam	Sand	None.	8.5a	37,000a	Colorado Springs, Colo.								
Moberly, Mo.	0.5a	1,39	1.39	Brick.	Sand		14.0a		Denver, Colo.	0.1b	22,000g	6,000	Concrete.		4.5g	132,468b	
	0.5a		1.48	Concrete.	Sand		18.0a				1,489	5,075	Concrete.		19.1b	12,616d	
Nevada, Mo.									Leadville, Colo.						9.16g	26,966v	
									Salida, Colo.							3,650g	
Sedalia, Mo.	2.5a	39,600	61,380	Con. & mac'm	Cem. grout.	5 years.	9.0a	90,000b	Douglas, Ariz.	0.5t	9,590	2,892		Adobe	*	9,590t	
							7.0g		Tucson, Ariz.		7,000g	0.50			None.	7,000g	
Springfield, Mo.																	
Webb City, Mo.									PACIFIC COAST:								
									Bellingham, Wash.	1.0b	10,623	29,3788	4" gravel		10 years.	36,320b	
									Spokane, Wash.	0.01a	190	708	Concrete.	Sand	10 years.	13,425a	
										0.78b	26,990	69,541f	Concrete.		10 years.	3,008b	
Atchison, Kan.	1.36a	19,891	25,522	Br. stone and brick.					Walla Walla, Wash.							57,593f	
									Los Angeles, Cal.	0.14a	0,946a				0.94b	40,000b	
Clay Centre, Kan.										12.41b					8.68d		
										0.07g							
Ft. Scott, Kan.																	
Hutchinson, Kan.																	
Kansas City, Kan.																	
Lawrence, Kan.									San Diego, Cal	0.33b	9,244	1,65	3-5		4.1f	43,215b	
										4.1j	12,722	1,38	3-5		3.0t	45,409g	

\*Work done by city.

\*Work done by city.

\*Mostly between street railway tracks.

+Along street railway tracks only

† Along street railway tracks only.  
†† At 2½ cents per sq. yd. per year.

Includes curbs, catch basins, and other expenses.  
Old macadam street resurfaced.

Includes curbs, catch basins, and other expenses.

\*\*\*Repaving on old foundation.

Lower Mississippi and Gulf all reported 5-year guarantees. One city on the Pacific Coast reported 10 years.

#### CONSTRUCTION DETAILS, ASPHALT PAVING.

In connection with asphalt paving in the Middle Atlantic States concrete was used in thirteen cases and macadam in one, the concrete being 6 inches thick in all but two cases, in one of which it was 5 and the other 4. In the South Atlantic only concrete was used. In the Ohio Valley only concrete was used, generally 6 inches thick. In the Upper Mississippi-Missouri only concrete was used, varying from 4 to 6 inches thick. In the Lower Mississippi and Gulf, concrete only, 6 inches thick. On the Pacific Coast concrete was used in two cases, 6-inch macadam in one and 4-inch gravel in another. The guarantees required were: In the Middle Atlantic, 1 year in one case, 5 years in five cases, 8 years in one case and 10 years in eight cases. In the South Atlantic, 5 years. In the Ohio Valley, 5 years in six cases, seven years in one case and 10 years in eight cases. In the Upper Mississippi-Missouri, 10 years in each case. In the Lower Mississippi and Gulf, 10 years in one case and 5 in another. On the Pacific Coast, 10 years in each case.

#### BLOCK PAVING AND BITULITHIC

In connection with asphalt block, in the Middle Atlantic States 5 years' guarantee is asked in one case and 10 years in two cases. In the Ohio Valley 2 years was asked in one case, 5 years in two cases and 10 years in one case.

For stone block, the foundation used in New England was concrete in six cases, sand in three cases and gravel in two cases. In the Middle Atlantic States concrete was used in five cases, sand in four cases, gravel in one case and cinders in one case. In the South Atlantic concrete was used in one place and sand in two. In the Upper Mississippi-Missouri concrete was used in both cases reported, and the same is true of the Rocky Mountain district.

For wood block the foundation was concrete in every case reporting, except one, which reported plank, this probably being old cedar blocks. The guarantee required for wood block, taking all the districts together, was 5 years in four cases, 7 years in one and 10 years in two.

The guarantee required for bitulithic was 2 years in one case, 5 years in nine cases, 6 years in one case, 9 years in one case and 10 years in four cases.

A number of cities require a guarantee for macadam pavement—that it be kept in repair for 1 year in six cases, 2 years in four cases, 5 years in five cases and 10 years in two cases. In the majority of cases, however, no guarantee is required, the city itself doing the work in a considerable percentage of the cities.

#### GENERAL INFORMATION CONCERNING PAVING

In connection with the reports sent in, a number of interesting items of information concerning paving were contributed. In connection with macadam paving, for instance, Douglass, Ariz., reports a pavement composed of smelter slag, the material being donated by the smelter company. The work is done by day's labor, the slag

being loaded upon dump cars of one cubic yard capacity and hauled two miles on the street railway. It is dumped on the street and spread by hand to a depth of six inches and rolled with a 15-ton roller, a binder having first been spread over it.

Tucson, Ariz., reports the use of a material called Caliche, described as "a lime formation which is rather difficult to excavate, but when the streets are graded they require very little attention, except in the business portion of the town where traffic is exceptionally heavy."

Anaconda, Mont., reports the use of crushed limestone containing a large amount of silica, which is reported as wearing to a hard rock surface and keeping very smooth. Anaconda has used this one year only, and so cannot certify as to its wearing qualities.

Cortland, N. Y., owns and operates its own rock crusher. The slag is given to the city by a wire manufacturing company, which also furnishes free the power for running the crusher. The material is placed upon the street by day's labor. The method of construction is believed to be original in Cortland, and streets paved with this slag have shown no signs of going to pieces after four years of use.

Troy, Ala., uses pyrites cinders from a fertilizer factory, which is spread upon the road, but probably not rolled, as it is stated that the only expense is that of hauling, a two-mule team hauling  $7\frac{1}{2}$  tons a distance of 10 miles in two hours. One ton covers a space 6 by 6 feet, 6 inches deep.

At Fort Atkinson, Wis., the cost of quarrying stone for macadam is 60 cents per cubic yard; hauling  $1\frac{1}{2}$  miles,  $37\frac{1}{2}$  cents per cubic yard; hauling and unloading from cars, 40 cents. The city is charged nothing for the rock used.

In Fairbury, Neb., the City Engineer reports that "the natural surface of the streets, a clay and gravel mixture, is such that we have not needed any artificial paving"—a condition which many small towns will envy them.

Nashville, Tenn., macadamized 2.23 miles of streets last year, costing, by contract, \$1.79 per lineal foot of 30 feet roadway. The city macadamized 7.43 miles of the same width of streets by day's labor at a cost of \$1.65 per lineal foot. This city also owns and operates its own bitulithic plant, and last year laid 529 square yards of bitulithic at a cost of \$1.28 per square yard.

Fort Wayne, Ind., has 27 miles of asphalt pavement, of which the largest amount is Trinidad Lake pitch, with California second, Bermudez third and Kentucky rock fourth.

Ardmore, Okla., reports her paving as being rock asphalt only, quarried  $2\frac{1}{2}$  miles from the city. This is placed on a 6-inch concrete foundation, and costs \$2.27 per square yard, the City Engineer stating that a large part of this price is for the concrete, which is expensive because both sand and broken stone have to be imported.

Clarksville, Tenn., reports the use of rock asphalt as a binder for macadam and finds it very satisfactory.

At Valparaiso, Ind., old macadam streets are being used as a foundation for brick paving.



# PAVING TO BE CONSTRUCTED THIS SEASON

**Kinds and Amounts aueary, or to Be Consumed**

a.	Stone block;	d.	Wood block;	e.	Bitulithic;	f.	Asphaltina;	g.	Macadam;	h.	Hassam i.	i.	Bituminous macadam;	k.	Cobble
b.	Asphalt block;	e.	Asphalt block;	f.	Not stated;	g.	Not stated;	h.	Not decided upon.	i.	Not decided upon.	j.	Not decided upon.	k.	Not decided upon.

NAME OF CITY	WORK CONTRACTED FOR				WORK DECIDED UPON BUT NOT YET CONTRACTED FOR				WORK CONTEMPLATED BUT NOT YET DEFINITELY DECIDED UPON			
	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost
NEW ENGLAND:												
Nashua, N. H.	None.	3,900	\$80		2.0g	52,800	\$	0.75	1.6b	33,300	\$75,000	
Attleboro, Mass.	0.33d	5,600	16,800		4.00ch	4,000	1.50			3,600	4,500	
New Bedford, Mass.	0.22g	3,000	1,500							2,330a	3,387	
Woonsocket, R. I.					2.700a					15,000a	12,709	
Bridgeport, Conn.					23,378d					5,466	12,000	
Danbury, Conn.					120,316g					52,000	15,000	
New Britain, Conn.					35,800a					16,000	37,600	
New London, Conn.	1.0g	17,600	8,800		5,000a					11,500	35,000	
Waterbury, Conn.		18,000f	40,000		12,000g					16,000		
MIDDLE ATLANTIC					10,000a							
Albany, N. Y.	1.15a	20,250	41,650		17,500							
Buffalo, N. Y.	0.82a	12,143	29,766		110,000							
	0.08b	1,535	4,940		6.83f							
	0.50d	9,338	40,800		185,291							
Corning, N. Y.					57,615							
Cortland, N. Y.					41,000							
Green Island, N. Y.					6,000							
Howell, N. Y.					4,500							
Jamestown, N. Y.	0.63f	15,596	49,341		13,000a							
Kingston, N. Y.	None.				20,000							
Little Falls, N. Y.					8,000a							
Olean, N. Y.					15,000f							
Port Jervis, N. Y.					10,000f							
Rochester, N. Y.					1.0f							
Solvay, N. Y.	0.20g	2,724	482		1,500							
Syracuse, N. Y.	0.01a	16,481	50,879		13,000a							
	2.19b	3,523	137,555		42,640							
Troy, N. Y.		5,800a	11,684		18,726							
Utica, N. Y.	0.16a	4,400	7,700		13,000							
Watertown, N. Y.	0.52a	10,340	25,732		13,000a							
Bayonne, N. J.	0.77b	14,000	35,817		20,000							
Camden, N. J.	0.5f	1,000d	3,135		8,000a							
East Orange, N. J.		8,240g	8,240		15,000f							
Gloucester, N. Y.	0.54b	9,996	28,488		10,000f							
Jersey, N. J.	0.51d	6,995	22,507		1.0f							
Long Branch, N. Y.		900g	810		0.1g							
Montclair, N. J.	0.2g	2,060g	1,700		0.1g							
Passaic, N. J.	0.2g	6,400a	15,232		0.1g							
Plainfield, N. J.					0.1g							
Rutherford, N. J.					0.1g							
Trenton, N. J.	0.5b	12,700	25,000		0.1g							
					0.1g							
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NAME OF CITY	WORK CONTRACTED FOR			WORK DECIDED UPON BUT NOT YET CON-TRACTED FOR			WORK COMPLETED BUT NOT YET DEFINITELY DECIDED UPON		
	Miles	Sq. Yds.	Esti-mated Cost	Miles	Sq. Yds.	Esti-mated Cost	Miles	Sq. Yds.	Esti-mated Cost
Berea, O.						\$50,000			
Bowling Green, O.									
Bucyrus, O.	0.30	4,869	\$2,058	0.81	13,245	2,198	0.59	9,000	\$68,000
Cambridge, O.	0.30	2,975	3,800				1.30	21,436	1,670
Chillicothe, O.				38.50	560,746	1,489,461			2,700
Cleveland, O.				1.26	18,500	64,040			
				2.60	50,503	208,572			
				0.14	3,600	11,341			
	0.04			0.26	3,740	9,780			
Conneaut, O.		7,050	15,300	0.70	14,800	26,500			1,500
East Liverpool, O.							1.20	27,183	
Elyria, O.		4,000	7,600		47,500	140,000			
Fremont, O.		7,790	1,230						
Kent, O.									
Lancaster, O.									
Lima, O.	0.80	14,384	30,306	0.68	16,570	35,120			1,780
Lorain, O.				0.25	4,000	11,828			
				0.40	8,200	28,200			
	0.48	12,350	33,373						
Marion, O.	0.51	8,200	24,104						
Newark, O.	0.50	6,000	1,800	0.75	8,000	1,800			
Newark, O.	0.50			2.00	19,000	1,500			
Norwood, O.	1.00		25,000	0.25		10,000			
Norwin, O.									
Painesville, O.	1.30	25,800	78,000						
Sandusky, O.									
Springfield, O.	3.90	70,860	103,583						
Toledo, O.									
Warren, O.									
Wauseon, O.									
Wellston, O.									
Wellsville, O.									
Wooster, O.									
Attica, Ind.									
Auburn, Ind.									
Bloomington, Ind.									
Brazil, Ind.									
Brookville, Ind.									
Columbus, Ind.									
Decatur, Ind.									
East Chicago, Ind.									
Elkhart, Ind.	0.36	8,350	20,232	1.05	18,155	29,410	0.75	17,600	1,603
Fort Wayne, Ind.	0.90	15,132	35,148	1.00	20,461	40,898	1.51	26,400	7,920**
Huntington, Ind.	0.70	12,000	22,000	0.10	1,121	2,970			
	1.30	20,000	45,000						
	0.50	8,600	10,000	0.25	4,000	5,000			
Martinsville, Ind.									
Michigan City, Ind.									
Muncie, Ind.									
Peru, Ind.	2.00	5,000	11,000	2.40	12,800	35,000			
Richmond, Ind.									
Terre Haute, Ind.									
Valparaiso, Ind.									
Wabash, Ind.									
Winchester, Ind.									
Blue Island, Ill.	8.00	100,000	2,000	0.90	17,302	39,484	0.20	5,800	2,500
Champaign, Ill.									
Champaign, Ill.									
Danville, Ill.	0.35	6,492	1,660	0.50	9,600	25,244	0.08	2,970	7,882

# PAVING TO BE CONSTRUCTED THIS SEASON

## Kinds and Amounts already, or to be, Contracted for. From Data Furnished by City Engineer, February 10th to 22nd.

In these tables letters are used to designate paving, as follows: a, Brick, b, Asphalt; c, Stone block; d, Stone block; e, Wood block; f, Bitulithic; g, Macadam; h, Hassam; i, Asphaltina; j, Bituminous macadam; k, Cobble, l, Gravel; m, Concrete; n, Bitulithic on old cobble foundation; p, Mosaic block; r, Shell; s, Rock asphalt; t, Slag macadam; v, Miscellaneous; w, Westrumite macadam; x, Not stated; y, Not decided upon.

NAME OF CITY	WORK CONTRACTED FOR			WORK DECIDED UPON BUT NOT YET CON- TRACTED FOR			WORK CONTEMPLATED BUT NOT YET DEFINITELY DECIDED UPON			NAME OF CITY	WORK CONTRACTED FOR			WORK DECIDED UPON BUT NOT YET CON- TRACTED FOR			WORK CONTEMPLATED BUT NOT YET DEFINITELY DECIDED UPON		
	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost		Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost	Miles	Sq. Yds.	Esti- mated Cost
Kenosha, Wis.....	2a	34,630	\$75,000	1.9a	26,219	\$62,894				Wagoner, Ok.....	0.5a	10,000	\$21,000	2a	35,000	\$60,000	2a	20,000a	\$2.04
La Crosse, Wis.....										Little Rock, Ark....							1.5b	40,000	100,000
Neenah, Wis.....										Pine Bluff, Ark.....	0.8a	12,500	23,500	0.25a	3,600	7,200	1g	30,000	75,000
Racine, Wis.....										Bessemer, Ala.....								12,000	8,000
Stevens Point, Wis....										Decatur, Ala.....							0.5a		
Sturgeon Bay, Wis.....										Montgomery, Ala....								20,000f	
Watertown, Wis.....										Jackson, Miss.....									50,000
Waukesha, Wis.....										Vicksburg, Miss.....									75,000a
Boone, Ia.....										Beaumont, Tex.....									
Cedar Rapids, Ia.....	0.46a	11,462	1.50							Dallas, Tex.....							0.8f	20,000	50,000
Clinton, Ia.....	3.93a	72,559	149,264															5,000g	
Council Bluffs, Ia....																			75,000a
Davenport, Ia.....																			
Glenwood, Ia.....																			
Keokuk, Ia.....																			
Marshalltown, Ia.....	1a	19,000	44,000							Denison, Tex.....								5,760a	
Mason City, Ia.....																			
Muscatine, Ia.....										Rocky Mountain:							1g	29,400	9,275
Oskaloosa, Ia.....										Anaconda, Mont.....								24,500f	
Sioux, Ia.....										Bozeman, Mont.....									
Waterloo, Ia.....	2.3b	52,150	99,400							Butte, Mont.....							0.5e	15,300	61,220
Lincoln, Neb.....										Great Falls, Mont....								35,000	9,000
										Colorado Springs, Colo.									
										Denver, Colo.....									9,000
Norfolk, Neb.....																			90,000
Brookfield, Mo.....										Salida, Colo.....							4.75m	40,000	
Cape Girardeau, Mo....										Tucson, Ariz.....							51		
Clinton, Mo.....																			
De Soto, Mo.....										PACIFIC COAST:									
Fulton, Mo.....										Bellingham, Wash....							2b	15,000f	45,000
Hannibal, Mo.....																			
Kirkville, Mo.....										Olympia, Wash.....									
Lexington, Mo.....	1.5a	26,400	39,600	0.11a	2,660	4,735				Spokane, Wash.....									
Macon, Mo.....	3a		1.13	1a		1.13				Los Angeles, Cal....									
Moberly, Mo.....																			
Nevada, Mo.....																			
Selalia, Mo.....																			
Springfield, Mo.....																			
Webb City, Mo.....																			
Argentine, Kan.....	1.84f	11,000g	8,000	5.000a	5,000a	10,000				San Diego, Cal.....							1.8g	91,036	
Atchison, Kan.....	0.32a	28,450	57,200	0.21a	3,545	4,431				Santa Clara, Cal.....							1.8g	91,036	
Ft. Scott, Kan.....																	1.8g	91,036	
Kansas City, Kan.....																	1.8g	91,036	
Manhattan, Kan.....																			
Pittsburg, Kan.....	0.42a	4,183	5,856	0.5a	8,659	12,555													
Topeka, Kan.....	1.26a	20,765	1,275																
RECEIVED TO LATE FOR CLASSIFICATION																			
Green Bay, Wis.....																			
Oklahoma, Okla.....																			
Seattle, Washington....																			
Visalia, Cal.....																			

\*Roughly approximate      †Selection between these to be made.      ‡Includes grading, curbing and other expenses.      ††Selection of pavement made after bids are received.      \*\*Work to be done by city.



Monmouth, Ill., uses broken-up sewer pipe for brick pavement foundation, an illustration of adapting construction to peculiar local conditions and materials.

Webb City, Mo., has this year changed its specifications for brick pavement so as to call for asphalt filler instead of cement, as heretofore.

Lancaster, O., has used both tar and sand filler, but the Engineer believes that the sand is as durable as the tar and costs less; consequently tar is no longer used.

Streator, Ill., endeavors to build as inexpensive pavements as possible, and obtains for \$1.18 per square yard

### Summary of Preceding Tables

#### PAVEMENTS NOW IN SERVICE

##### TOTALS BY DISTRICTS

DISTRICT	No. of Cities Reporting	Kind of Paving	WORK DONE IN 1907		TOTAL AMOUNT IN SERVICE AT PRESENT TIME		Total Equivalent Miles
			Miles	Sq. Yds.	Miles	Sq. Yds.	
New England	47	Brick.....		47,366		361,777	20.10
		Asphalt.....				215,021	11.95
		Asph. block.....				22,931	1.27
		Stone block.....		87,303	3.0	2,312,015	131.45
		Wood block.....		15,572		49,008	2.72
		Bitulithic.....		30,719		277,859	15.44
		Macadam.....	9.05	249,402	295.35	7,907,693	734.87
		Hassam.....		53,888		101,831	5.66
		Cobble.....				360,491	20.02
		Asphaltina.....				37,292	2.07
		Gravel.....	2.60		63.0	249,752	76.88
		Bit. macadam.....				3,379	0.19
Middle Atlantic	82	Brick.....	19.75	494,812	329.57	699,020	333.45
		Asphalt.....	9.0	483,717	501.25	139,537	509.00
		Asph. block.....		11,379	3.1	104,801	8.92
		Stone block.....		89,206	197.1	367,131	217.49
		Wood block.....		2,300		17,923	0.99
		Bitulithic.....	2.0	55,245	8.25	97,228	13.65
		Macadam.....	3.0	180,047	404.5	384,184	425.84
		Gravel.....			52.0		52.00
		Cobble.....			1.0	224,349	13.46
		Asphaltina.....				68,183	3.78
		Slag.....			1.0		1.00
South Atlantic	27	Brick.....		285,378		1,538,061	85.45
		Asphalt.....		10,862		246,142	13.67
		Asph. block.....		47,376		373,078	20.72
		Stone block.....		17,738		1,042,404	57.91
		Wood block.....		15,997		42,209	2.35
		Bitulithic.....		139,050		272,160	15.12
		Macadam.....		95,368	8.0	1,078,842	67.94
		Bit. macadam.....		7,118			
		Hassam.....		25,470			
Ohio Valley	113	Brick.....	5.8	2,024,201	631.19	7,806,107	1,069.86
		Asphalt.....		288,545	32.13	1,367,757	108.12
		Asph. block.....	0.1	116,600	13.5	141,896	21.38
		Stone block.....		40,667	120.0	140,972	127.83
		Wood block.....			8.41	79,108	12.81
		Bitulithic.....		36,000	13.5	189,352	24.02
		Macadam.....	15.0	354,155	495.33	1,365,150	571.17
		Gravel.....			598.0	133,249	605.40
Upper Mississippi-Missouri	115	Brick.....	0.5	964,119		9,156,065	508.67
		Asphalt.....		707,370	22.753	5,497,142	328.15
		Asph. block.....			1.445	64,301	5.02
		Stone block.....		4,034	0.159	286,472	16.07
		Wood block.....		239,490	8.095	956,085	61.21
		Bitulithic.....		40,837	1.0	141,387	8.85
		Macadam.....	0.23	227,067	37.649	2,656,164	185.21
		Bit. macadam.....		907	.341	61,389	3.75
		Gravel.....	3.5	16,000	5.0	102,850	10.71
		Cobble.....				1,395	1.94
		Concrete.....		14,236	8.24	7,900	1.26
Lower Mississippi & Gulf	20	Brick.....	2.75	27,778	12.26	197,340	23.22
		Asphalt.....	2.25	75,842	4.26	121,326	11.00
		Gravel.....				37,800	2.10
		Stone block.....			0.73	108,000	6.73
		Cobble.....				7,820	0.43
		Bitulithic.....		96,293		260,000	14.44
		Macadam.....	1.5	91,611	28.56	281,500	44.20
		Concrete.....		600			
		Rock asphalt.....		52,000		52,000	2.89
		Bit. macadam.....			0.41		0.41
Rocky Mountain	20	Brick.....		5,838		13,603	0.76
		Asphalt.....		1,489		282,984	15.72
		Stone block.....		5,050		90,441	5.02
		Wood block.....		15,000		31,200	1.73
		Bitulithic.....		30,452		30,452	1.60
		Macadam.....		20,200		971,694	53.98
		Slag macad'm.....		9,590			0.53
		Gravel.....	2.0		5.0	22,000	6.22
Pacific Coast	10	Brick.....	0.142	190	0.935	13,425	1.68
		Asphalt.....	12.432	120,813	40.07	328,859	58.34
		Stone block.....			1.28		1.28
		Macadam.....	0.066		8.64	45,409	11.16
		Bitulithic.....			8.0	57,563	11.20
		Bit. macadam.....		127,200		127,200	7.07

### CONSTRUCTION CONTEMPLATED IN 1908

#### TOTALS BY DISTRICTS

DISTRICT	No. of Cities Reporting	Kind of Paving	WORK CON-TRACTED FOR		WORK DECIDED UPON BUT NOT YET CONTRACTED FOR		WORK CONTEM-PLATED BUT NOT YET DEFINITELY DECIDED UPON	
			M'ts	Sq. Yds.	Miles	Sq. Yds.	Miles	Sq. Yds.
New England	47	Brick.....						66,368
		Asphalt.....		48,000				36,270
		Stone block.....				9,800		
		Bitulithic.....		18,000				279,136
		Macadam.....				38,200	12.5	
		Cobble.....		3,900				19,000
		Hassam.....						
Middle Atlantic	82	Brick.....		111,463	1.0	297,247	11.5	210,860
		Asphalt.....	5.0	96,870	6.25	189,862	0.5	108,440
		Asph. block.....				13,000	1.25	
		Stone block.....		34,933		67,566		9,075
		Bitulithic.....	2.0	29,686		22,328		
		Macadam.....		50,936	0.75	33,396	2.0	43,240
South Atlantic	27	Brick.....		48,105		55,084		117,113
		Asphalt.....		26,022				3,700
		Asph. block.....						15,100
		Stone block.....		59,878		27,252		50,000
		Wood block.....						32,275
		Bitulithic.....		41,708				96,700
		Macadam.....		40,715	0.5	34,000		
Ohio Valley	113	Brick.....	0.5	631,182	4.75	1,242,014	6.65	1,008,706
		Asphalt.....		52,350		47,871		84,737
		Asph. block.....	0.33	8,200				3,154
		Stone block.....				70,503		
		Wood block.....						55,000
		Bitulithic.....				15,000		245,994
		Macadam.....	1.0	178,380	11.25	60,366	4.5	
		Westrumite macadam.....		1,820				
Upper Mississippi-Missouri	115	Brick.....	3.0	349,531	2.75	175,792	3.92	456,067
		Asphalt.....		52,150		66,153		69,490
		Wood block.....		55,686		14,250		
		Bitulithic.....		28,450				206,032
		Macadam.....		147,367		128,323		
		Hassam.....		850				
		Bit. macadam.....		19,024				
		Gravel.....			5.0	26,400		61,500
		Unselected.....				137,500		
Lower Mississippi and Gulf	20	Brick.....		137,535		85,040		75,760
		Asphalt.....		156,231		14,000		39,000
		Bitulithic.....		57,074				20,000
		Macadam.....				7,000		17,000
		Bit. macadam.....		732				20,000
		Unselected.....						
Rocky Mountain	20	Asphalt.....		38,865				
		Stone block.....		6,022		15,171		15,300
		Wood block.....						35,000
		Macadam.....				26,460	1.0	40,000
		Bit. macadam.....		18,088				
		Concrete.....				17,640		
		Gravel.....					5.0	
		Unselected.....						41,000
Pacific Coast	10	Brick.....	3.9	7,374	4.3			
		Asphalt.....	4.7	122,655	24.8	105,284		91,036
		Stone block.....	0.3					
		Macadam.....	1.0		1.8			
		Unselected.....						43,000

a brick pavement laid on a rolled cinder foundation and one-inch sand cushion, with sand filler.

In Albany, N. Y., brick was laid last year by contract on concrete, rolled gravel and Telford foundation. The first cost \$2.277 per square yard, the second \$1.879 and the third \$2.188, all prices including excavation.

It is interesting to note that in Butte, Mont., "the price this year is excessive, largely because of undue haste in letting contract." If the truth were known it is probable there are many others of which the same could be said.

In the preceding full-page tables, each letter designating a kind of pavement refers to the number to which it is connected and also to everything in the same line and to the right as far as the next letter.

Since the tables were made out and the summary prepared,—in fact just before going to press,—reports from six cities were received. Parts of these are to be found at the foot of table 2. The remainder on page 281. Shenandoah, Pa., reports no paving done for the last eight years, and prospects for the present year unknown yet.

## MUNICIPAL BOND SALES

Data Concerning Sales of Municipal Bonds During January by Cities of Less than 100,000 Population—  
Financial Statistics of Cities Listed

NAME OF CITY	Estimated Population	ACTUAL VALUE OF ASSESSABLE PROPERTY (estimated)		Ratio of assessed to actual value	Bonded Debt	Sinking Fund	NET BONDED DEBT		Tax Rate per \$1,000 Ass'd Value	BOND SALES, JANUARY, 1908				Basis
		Total	Per Capita				Total	Per Capita		Term of Years	Amount	Interest	Price	
Thomaston, Ga.	2,000	\$1,500,000	\$750	60%	\$22,000	\$1,000	\$21,000	\$10.50	\$8.50	10-19 ser.	\$5,000	6% s.a.	102.00	5-797
Carmi, Ill.											5,000	6%	Par.	
Elgin, Ill.	26,427	4,924,691	186	20%	141,000	9,099.16	131,901	5.73	18.00		2,400	5%	Par.	
Knightstown, Ind.	2,000	1,600,000	800	75%	23,000		23,000	11.50	23.90	7-12 ser.	12,000	5%	103.558	4-534
Cedar Falls, Ia.	7,000	4,000,000	571	25%	40,000	7,500	32,500	4.64	24.00	5-6 avg.	14,500	6%	Par.	
Newton, Ia.										5-10 opt.	40,000	5%	101.375	4-687
Caney, Kan.	3,500	1,080,000	308	25%	53,000	2,000	51,000	14.57	8.55	10	30,000	6% s.a.	Par.	
Cynthiana, Ky.										15 avg.	12,000	5%	100.50	4-952
Bath, Me.										19	16,000	4% s.a.	100.539	3-959
										40	50,000	4%	103.03	3-822
										30	60,000	4%	103.11	3-825
										30	40,000	4%	102.43	3-862
										30	49,000	4%	100.25	3-985
										20	18,000	4%	100.25	3-981
										40	40,000	4%	100.50	3-975
										30	25,000	4%	100.50	3-971
										20	50,000	4%	Par.	
										40	25,000	4%	Par.	
										20	15,000	4%	Par.	
										30	10,000	4%	Par.	
										20	1,000	4%	Par.	
											25,000	4%	101.597	
										1-10 ser.	31,500	4%	100.031	4-493
										3-20 ser.	270,000	4%	100.02	3-998
										10	125,000	4%	102.02	3-998
											20,000		103.75	
										10	22,000	4%	102.40	3-700
										10	161,000	4%	100.82	3-900
										20	10,000	4%	Par.	
										10	7,000	4%	Par.	
										4-9 ser.	18,000	5%	100.283	4-948
										10 1/2 avg.	45,000	5%	100.066	4-998
										5	4,000	5% s.a.	Par.	
										5-20 opt.	96,000	5% s.a.	Par.	
										35	25,000	4%	Par.	
										20	184,000	5%	Par.	
										10	19,000	5%	Par.	
										20	160,000	5%	Par.	
										20-30 opt.	15,000	5% s.a.	Par.	
										16 1/2 avg.	50,000	5%	Par.	
										13 avg.	8,000		100.50	
										10	63,000	5%	101.00	4-872
										6	25,000	5%	100.32	4-960
										8 mo.	100,000	5%	Par.	
										20	23,900	4%	Par.	
										12 1/2	9,350	5%	108.75	5.00
										30	125,000	5% s.a.	100.10	4-993
										10	2,000	4%	Par.	
										20	30,000	4%	Par.	
										7 1/2 avg.	1,800	4% s.a.	Par.	
										1-10 ser.	5,088	6% s.a.	103.065	5-446
										10	10,000	4% s.a.	100.50	3-939
										2 1/2 avg.	5,143	5% s.a.	100.68	4-731
										3 1/2 avg.	5,000	5% s.a.	104.52	4-372
										4 1/2 avg.	5,000	5% s.a.	102.125	4-377
										2 1/2 avg.	37,580	4% s.a.	Par.	
										6 1/2 avg.	10,012	5% s.a.	Par.	
										5-10 opt.	2,000	4% s.a.	100.30	3-933
										1-10 ser.	13,677	4%	100.60	4-375
										1-10 ser.	13,411	4%	100.60	5-375
										1-10 ser.	2,856	4%	100.63	4-369
										1-10 ser.	9,450	4%	100.10	3-979
										19 1/2	20,000	4% s.a.	105.625	4-082
										1-10 ser.	15,168	4% s.a.	100.85	4-324
										1-5 ser.	7,500	5%	100.87	4-685
										10 1/2	23,000	5% s.a.	104.304	4-401
										5 1/2 avg.	10,786	5% s.a.	102.266	4-522
										5 1/2 avg.	8,005	5% s.a.	102.211	4-52
										2 1/2 avg.	3,780	5% s.a.	100.82	4-675
										1-10 ser.	9,165	4% s.a.	Par.	
										3 1/2 avg.	600	5%	Par.	
										10-15 opt.	13,500	5% s.a.	103.625	4-545
										16 1/2 avg.	50,000	5%	102.00	4-82
										4 avg.	5,610	5% s.a.	101.209	4-665
										1-7 ser.	7,805	5% s.a.	101.499	4-586
										11 avg.	20,000	5% s.a.	Par.	
										2-3 ser.	400	6% s.a.	105.15	3-82
										30	6,000	5% s.a.	110.523	4-367
										10	25,000	5% s.a.	101.22	4-844
										1-10 ser.	5,000	6% s.a.	103.26	5-308
										1-5 ser.	1,900	5%	101.184	4-573
										7 1/2 avg.	15,000	5% s.a.	103.436	4-405
										1-5 ser.	6,500	4%	Par.	
											1,500		Par.	
										30	40,000	6%	100.75	5-948
										10-20 opt.	5,000	4% s.a.	103.00	3-639
										10-20 opt.	3,000	4% s.a.	102.50	3-698
										10-20 opt.	7,000	4% s.a.	102.00	3-758
											5,500	5%	Par.	
										40	50,000	5% s.a.	102.00	4-886
										20-40 opt.	20,000	5%	Par.	
											5,000	5%	Par.	
										10	4,000	5%	Par.	
										20	100,000	5%	Par.	
										20	25,000	4 1/2% s.a.	100.327	4-475
Sharon Hill, Pa.	1,600	1,260,000	787	50%	70,000	12,800	57,200	35.75	1.65					
Camden, S. C.	4,500	2,500,000	555	50%	67,500	2,500	65,000	14.44	10.00					
Brownwood, Tex.														
Meridian, Tex.														
Clarkston, Wash.														
Walla Walla, Wash.	20,000	16,817,650	841	40%	762,700	42,703	719,007	35.00	18.00					
Eau Claire, Wis.	20,000	10,000,000	500	100%	305,000	32,000	273,000	14.65	28.45					

## PAVEMENTS AND PAVEMENT FILLERS

IN response to requests from us, the following letters have been submitted, stating the conclusions which several city engineers have reached, based upon their personal experiences. In addition to these, City Engineer Bertram Brewer, of Waltham, Mass., in a brief letter, defends macadam for suburban streets. "They are comparatively cheap and are not slippery. If they are properly cared for they wear very well." Massachusetts has acquired an enviable reputation for good roads because of its macadam paving, and he believes "there is no better for an all-around moderate-priced pavement." The chief objections he finds to other more permanent pavements, such as stone, brick, wood, etc., are that they are expensive and slippery, the latter being true especially of brick and wood; but they are often necessary in the more traveled streets.

These opinions are, of course, not claimed by the writers to be other than personal ones, and have undoubtedly been influenced to a considerable degree by local conditions perhaps even more than by personal prejudice; as is so well stated by Mr. Williams in his letter.

Paducah, Ky., Feb. 17, 1908.

Editor MUNICIPAL JOURNAL AND ENGINEER,  
Flatiron Building,  
New York.

DEAR SIR:—We have used sand, cement and asphalt fillers, but I have no hesitancy in saying I believe asphalt preferable to either of the others for the following reasons:

1. It deadens to a considerable extent the noisy, rumbling sound which we get from the cement filler.
2. In laying brick, it is almost impossible, owing to the unevenness of the brick, to get the top surface perfectly smooth; hence, with cement filler the brick are held in this position, and consequently the edges begin to chip and wear, and when this once begins, the deterioration of a brick street increases much more rapidly from year to year; but with the asphalt filler the elasticity of the asphalt will allow the brick to iron out under traffic and become smooth on top without the brick chipping at the edges, and hence the life of the street is increased very materially. The life of a brick street depends very much upon its manner of construction, for a street (laid with the same kind of brick) with the edges of one brick higher than the others will not last as long by three or four years as one laid perfectly smooth on top. On account of the variation in brick, it is a very difficult matter to get contractors to lay the brick to that degree of smoothness on top that they should be, and with the asphalt filler a large percentage of this uneven surface is overcome by the ironing out under traffic after the filler has been applied.
3. The great trouble all engineers have experienced from brick streets heaving from expansion, which is frequent with cement filler, even where expansion joints of asphalt have been put in, is entirely obviated by using asphalt filler.
4. It might be said that pitch, or sand filler, would obtain the same results as I have mentioned above. While I do not deny that they would give some of the results, yet they certainly do not possess as many good qualities as asphalt. While pitch would make the street sanitary and allow it to iron out under traffic, yet in warm weather it is liable to run and stick to the feet of pedestrians; and, in my opinion, has not the qualifications of asphalt as a filler. Sand filler absorbs all the impurities and makes a very unsanitary street, and, in cities where street flushers are used for cleaning purposes, the filler is washed out for a depth of

from one-half to three-quarters of an inch, thus allowing the brick to chip on the edges, following which the deterioration of the street soon begins and increases rapidly each year, and the life of the street is shortened at least five or six years.

5. While the first cost of asphalt filler is considerable more than of the others, yet in my opinion it is much cheaper in the end, and the reason I have not used it more is because I cannot get my city authorities to realize that the increase in first cost is nothing as compared to increasing the life of a street from four to five years.

So, in conclusion, I will say asphalt filler is, in my opinion, the best thing we have on the market for brick streets, and the reason I have not used it is on account of the city authorities not being willing to pay the increased cost. I think I would be safe in saying that if the cost were the same as cement filler ninety-nine per cent. of the engineers would use it.

Yours very truly,

L. A. WASHINGTON,  
City Engineer.

New Bedford, Mass., Feb. 13, 1908.

Editor MUNICIPAL JOURNAL AND ENGINEER,  
New York, N. Y.

DEAR SIR:—Replying to your favor of the 11th, asking for my opinion of the various pavements in use in this city, I will state that we have streets with the following surfaces:

Granite block paving.  
Bitulithic paving, laid by Warren Bros. Co.  
Vitrified paving blocks.  
Macadam.  
Sheet asphalt.  
Asphalt blocks.  
Cobble paving.

It is my opinion that granite blocks laid on a concrete foundation give THE BEST surface for hauling heavy loads. They also have the greatest wearing quality, and can be maintained at the lowest cost. This paving is liked the best by the teamsters. It can be laid at any grade, and the steeper the grade the greater its advantage over other pavements. If the joints are filled with cement or pitch it is perfectly sanitary. It is not liked by adjacent residents nor by those people who use light vehicles. To the first it is noisy and to the latter it is disagreeable on account of the noise and the jar produced by the irregularities in the surface of the blocks. As far as practicable, block paving should be restricted to streets used principally by heavily loaded teams.

Our only experience with vitrified paving blocks is on a bridge and approach to the same, and although a portion of the traffic consists of heavily loaded teams, this pavement has shown VERY GOOD wearing properties. It is, however, slippery under certain conditions, and for this reason is not popular with teamsters. Drivers of light vehicles and automobiles like it. If it were in a residential section there would probably be objections on account of the noise.

The bitulithic paving laid by Warren Bros. Co. has given very general satisfaction. It has all the advantages of a smooth pavement and is not quite as noisy as brick or sheet asphalt. It is slippery under certain conditions, although not as much so as sheet asphalt, but would not afford sufficient footing for heavy loads on grades of over two per cent. In first cost it is cheaper than granite blocks, but I do not consider that it will wear as long under heavy traffic and will therefore be more expensive to maintain.

We have a large area of macadam, and on account of its low first cost it is the most available surface for many streets where a city simply cannot afford to lay the more expensive pavements. If some of the processes now under trial in various cities for treating macadam with preparations of oil and tar are successful, then macadam will undoubtedly



be the cheapest and most satisfactory paving material both as to first cost and maintenance for streets of ordinary traffic, such as light vehicles, automobiles and a moderate amount of heavy loads. As it is macadam is the salvation of a city growing as rapidly as New Bedford, where the demand for improved streets is so imperative that its financial resources will not admit of the general use of the more expensive pavements.

I do not consider that sheet asphalt, asphalt blocks and cobble paving can be considered in comparison with the pavements already described, either as to cost, serviceability or wearing quality.

In comparing my views with those of other engineers, it is fair to say that they are the result of my experience in New Bedford, which has very good natural conditions as to drainage, grades and soil, which are the essentials for the construction of a good road, no matter what the wearing surface. On the other hand, it has a very moist atmosphere and great variations in temperature, producing conditions which will make any smooth surface pavement slippery at times and which in part accounts for our lack of success with sheet asphalt and asphalt block. New Bedford is also a large manufacturing center, consuming an enormous amount of raw material, all of which is handled by teams.

Very truly yours,

WILLIAM F. WILLIAMS,  
City Engineer.

Holyoke, Mass., Feb. 19, 1908,

Editor MUNICIPAL JOURNAL AND ENGINEER,  
Flatiron Building,  
New York.

Dear Sir:—Of the pavements that have been laid in the city of Holyoke within the past dozen years or so, about 44,500 square yards are of vitrified brick, 14,500 square yards of bitulithic, 15,500 square yards of wood block and 13,000 square yards of sheet asphalt. Of these four different kinds of pavements two of them, namely, vitrified brick and wood block, have been laid on business streets, while bitulithic has been laid on a quasi-business street and sheet asphalt on a residential street.

About half the brick pavement has been laid eleven years, all of the bitulithic six years, half the wood block four years and all of the sheet asphalt three years.

The vitrified brick is laid on grades as high as six per cent., the bitulithic on grades as high as five per cent., while the wood block and asphalt are laid on practically flat grades.

On the grades as high as five or six per cent., which may be considered comparatively steep, the pavements used are not considered slippery and teamsters have no complaints to make about them. All of these pavements have given general satisfaction and have cost nothing for repairs as yet.

Our experience here with these pavements is not perhaps of sufficient length to make any decided statement as to their relative serviceability, wearing qualities, etc.

In the light, however, of what we have had, we believe now that wood block will prove the most durable, with vitrified brick next, while it would be hard for us to say at present which of the other two should get third place.

There is one thing, however, that we are very decided upon, and that is that wood block or sheet asphalt should be laid only in streets having flat or very little grade, while brick and bitulithic may be laid in streets having grades as high as five or six per cent. without becoming dangerously slippery for teaming.

Bitulithic is preeminently the favorite pavement with teamsters and horsemen in this city, with vitrified brick second, asphalt third and wood block last. On the other hand, wood block is liked best by merchants and abutters on

account of it being the least noisy, with either bitulithic or asphalt second and brick last.

In regard to the class of streets in which we would lay these pavements, our preference would be wood block on business streets having heavy traffic and flat grades; vitrified brick on business streets having some grade; asphalt or bitulithic on residential or business streets having light travel and flat grades, and bitulithic on residential or business streets with light travel and some grade.

From a sanitary standpoint we see little difference between these pavements, but would consider asphalt the most sanitary, bitulithic next, brick third and wood block last.

Because we consider it unsanitary when laid with sand joints, but more especially because of its noise, we are not laying any more granite block pavement in this city except on steep grades where none of the other pavements mentioned would be suitable. On the contrary, we are removing all the granite pavement laid on our business streets and replacing it with wood block or vitrified brick.

It may be of interest to municipal officials to know that after some experimenting we laid 10,000 yards of common tar macadam last year and expect to lay a considerably larger amount of it this year. The tar we receive from our own municipal lighting plant. In the construction of the macadam it is applied after the second course of stone is spread and rolled, and again after the next or surface coat of screenings is spread and rolled. A light coat of screenings is then spread on the tar and rolled in as a finishing coat. This makes an excellent roadway for residential districts at a cost very little above the ordinary macadam.

To get the best results our experience has taught us that the broken stone screenings should be free from all dust and as thoroughly clean as if washed. This is the point that should be emphasized, otherwise, if the screenings contain dust or the surface of the roadway is dirty before the tar is applied, the poorest results will be obtained.

JAMES L. TIGHE,  
City Engineer,

Muskegon, Mich., Feb. 15, 1908.

Editor MUNICIPAL JOURNAL AND ENGINEER,  
Flatiron Building,  
New York.

DEAR SIR:—We have used about twenty-four brands of paving brick and laid them on sound foundation and concrete foundation, and both with and without expansion joints, but all have been filled with Portland cement grout (the street railway uses sand filler in their tracks). These pavements are noisy, crumble in spots and keep a repair crew busy all summer. Our bituminous macadam pavements have never needed any repair. Teamsters will drive several blocks to get off brick onto bituminous macadam, and the people gladly pay the difference in cost. We use asphalt instead of tar in constructing bituminous macadam.

Sanford street has street and interurban cars. It was paved two years ago with bituminous macadam, which has not been affected so far, the street being as good as when built, with no signs of wear or cracks. Muskegon avenue, built in 1902, has never needed any repairs and is good as new. We have let a contract to pave our main street (Western avenue) with bituminous macadam to the Cleveland Trinidad Asphalt Paving Co. This street has street and interurban cars, as has Sanford street. For light or heavy traffic we prefer bituminous macadam, or, as we call it, "asphaltic concrete," to all other paving.

Yours respectfully,

CLIFFORD S. GAMBLE,  
City Engineer.

# MUNICIPAL JOURNAL AND ENGINEER

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Readers are invited to contribute to the MUNICIPAL JOURNAL AND ENGINEER, either in the form of special articles or of letters discussing matters of current interest.

It is also desired that the facilities furnished by the reference library in this office should be widely known and freely used by those interested in municipal affairs. Visitors will be welcomed and provided with conveniences for search, and inquiries by mail will be promptly dealt with.

MARCH 4, 1908.

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## Paving Statistics in This Number

THERE is published in this number a table of statistics concerning street paving which we believe is more nearly complete than anything ever previously attempted, considering the freshness and authenticity of the information; and more up-to-date than any previous collection which at all compares with it in completeness. There is not a figure or statement given which was not furnished by a city engineer (or other city official in nineteen cases) within less than a month of the date of publication; and the information is therefore as reliable as it would be practicable to attain. The United States census bureau has published statements of the amounts of the various kinds of paving in all but three or four cities of the country (even the government cannot extract information from some officials), but the collection and compilation was continued for months, and the information was at least a year or two old when published.

For the reasons stated in the article it is believed that the table contains reports concerning three-fourths of the paving in the country, if we exclude the few largest cities, whose traffic conditions are to a certain degree peculiar. It would seem, therefore, to be sufficiently complete to permit reasonably accurate comparison and deductions to be made. It appears to show that macadam is the most common street paving in the New England, Middle Atlantic, Lower Mississippi and Rocky Mountain districts; but not in the others (only city streets, of course, are included), which was somewhat surprising to us. That brick leads in the South Atlantic, Ohio Valley and Upper Mississippi districts; and asphalt on the Pacific Coast. Aside from macadam, stone block is the most common pavement in New England, where granite abounds; asphalt in the Middle Atlantic States, where there seems to be no local product available, but wealth can command smooth pavements; brick in the South Atlantic States, Ohio valley and Upper and Lower Mississippi, throughout much of which territory brick clay is found, rendering possible a cheap but smooth and durable pavement; and on the Pacific coast and comparatively neighboring region of the Rocky mountains asphalt paving leads, California asphalt having probably played a decisive part in this. The patented pavements, bitulithic, wood block and Hassam, make a creditable showing in the list, and especially in that of work proposed for this year.

The table of contemplated construction, while it shows quite a little work in prospect for this year, is by no means a fair index of what is to be expected, since in a great many cities nothing whatever has yet been done toward preparing for the year's work—a delay the objections to which we have before discussed. This table shows the work contemplated in several hundred cities, however, and should give contractors considerable information as to what prospect there is for work in these cities. It appears from these reports that a considerable amount of brick, asphalt and bitulithic paving is to be done, with several other kinds of paving represented. Altogether there is every prospect that the season upon which we are now entering will be a busy one in the paving line.



## BRICK PAVING IN A NUMBER OF CITIES

(Excavation for foundation not included in costs)

NAME OF CITY.....	CHICAGO, ILL.	SHEBOYGAN, WIS.	PINE BLUFF, ARK.	ATCHISON, KANS.	LAWRENCE, KANS.	KANSAS CITY, MO.	DALLAS, TEX.	ROCHESTER, N. Y.	KINGS- TON, N. Y.	ERIE, PA.	WILMINGTON, DEL.	GREENSBORO, N. C.	HUNTSVILLE, ALA.	MONTE- REAL, CANADA	TORONTO, ONT.
<b>FOUNDATION—</b>															
Gravel.....	6 ins. 50c.	8 ins. 35c.	Not used	Not used	Not used	Not used	Bank grv. 1 6 ins. 80c.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Thickness.....	6 ins.	8 ins.	Not used	6 ins.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Cost per square yard.....	50c.	35c.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
<b>MACADAM—</b>															
Kind of stone.....	Limestone	Limestone	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Cost per square yard.....	50c.	40c.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Concrete, natural cement.....	None used	None used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Thickness.....	6 ins.	6 ins.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Proportions.....	1:3:5	1:3:5	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Concrete, Portland cement.....	6 ins.	6 ins.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Thickness.....	6 ins.	6 ins.	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
Proportions.....	1:3:5	1:3:5	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	None used now
<b>CURB—</b>															
Kind of stone.....	70c.	50c.	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total	Inc. in total
Thickness in inches.....	2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.	1 1/2 ins.
Make used.....	Various	Metrop'l'n	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville
<b>BRICK—</b>															
Kind used.....	Various	Metrop'l'n	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville	Coffeyville
Cost per square yard.....	41 to 44	43	45	63	63 on edge, 40 flat	60-62	46-57	41-50	42	42	44	42	44	42	44
Cost, f. o. b. cars at city.....	\$20.50- \$23.00	\$26.00	\$26.00	\$11.00 on the street	\$9.90	\$11.00	\$14.20	\$10.00 per sq. yd.	\$12.00	\$12.00	\$19.30	\$12.00	\$21.65	\$12.00	\$18.00
Cost per square yard, laid and filled, exclusive of foundation.....	\$1.90	\$1.50	\$1.90*	\$1.90*	\$1.90*	\$1.15	\$1.71- \$1.45	\$1.25- \$1.40	\$2.65	\$1.51	\$1.52	\$2.08*	\$1.11	\$2.08*	\$1.60
Guarantee required.....	5 years	None	5 years	5 years	1 year	7 years	5 years	10 years**	None	Port. cem.	None	Port. cem.	Port. cem.	Asph. cem.	5 years
Kind used.....	Tar cem.	Port. cem.	Sand	Port. cem.	Sand and grout	Sand; Port. cem.; asph.	Port. cem. grout	Port. cem. grout	Port. cem. grout	Port. cem. grout	Sand	Port. cem.	Sand	Asph. cem.	Com. grout
Prices of materials.....	\$1.65	\$1.15- \$1.25	\$2.40	\$1.50	\$1.40- \$1.65	\$1.30- \$1.60	\$1.75 per ton	\$1.50	\$1.50	\$1.50	\$1.50 per ton	\$1.50	\$1.60	\$1.50	\$1.33
Broken stone per cubic yard.....	\$1.55	\$1.10 av.	\$1.80	85 cts.	40c-65c.	\$1.20- \$1.50	\$1.25	\$1.00	\$1.00	\$1.25	\$1.05 per ton	\$1.00	\$1.65	\$1.00	90c.
Gravel per cubic yard.....	\$1.00- \$1.25	75c.	\$1.00	\$1.00	\$1.10	\$1.00	\$1.10	\$1.00	\$1.00	\$1.25	\$1.05 per ton	\$1.00	\$1.65	\$1.00	90c.
Sand per cubic yard.....	\$1.40- \$1.80	90c.	\$2.00	\$2.30	\$1.60- \$2.00	\$1.75- \$2.00	\$2.25	\$1.80	\$1.80	\$1.80	See note	See note	0.78	60c-70c	\$1.88
Natural cement per barrel.....	\$4.00- \$5.00	\$2.00- \$5.00	\$3.50	30c. hr.	\$4.00	\$3.50	\$3.50	40-50c. hr.	\$3.50	\$3.00	\$3.00	\$3.00	3.00	25-30c. hr.	\$4.00
Portland cement per barrel.....	\$5.00- \$6.00	\$2.50	\$5.00	22c. hr.	\$1.50- \$1.60	\$1.75- \$2.00	\$3.00	40c. hr.	\$2.00	\$2.00	\$2.00	\$2.00	2.00	40-50c. hr.	\$5.00
Foremen.....	25c-30c.	\$1.50- \$1.75	1.50	18 1/2c. hr.	\$3.00	\$4.00	\$1.75- \$2.00	23c. hr.	\$1.25	\$1.25	18 1/2c. hr.	\$1.25	1.00	20c. hr.	\$2.00
Unskilled.....	\$5.50- \$6.00	\$4.50	3.50	37 1/2c. hr.	two-horse	two-horse	\$3.50	50 1/2c. hr.	\$1.00	\$1.00	31 1/2c. hr.	\$1.00	3.00	30c. hr., two horse,	\$5.00
Teams.....															

REMARKS.—\*Includes foundation and excavation. †Mixed with Portland cement. ‡Additional 9 ins. between, and for 2 feet outside of car-tracks. \*\*Ten per cent. of cost, including foundation, reserved for ten years; interest paid to contractors. ††No. per sq. yd.; Johnsonburg, repressed, 44; Calder, 41; Shawmut, 45; Metropolitan, 41; Metropolitan special, 47; Johnsonburg wire cut, 50. ‡‡Includes excavating old telford pavement 18 to 24 ins. thick and hauling this 1/2 mile to 1 mile and spreading on streets there. §§Expansion joint every 25 feet. ††Cost in 1906, including foundation, also grading, 9 ins. depth, estimated to cost 8c. per sq. yd. None laid since 1906. Labor and material prices for 1906. \*\*\*Tons of 2,000 lbs. delivered on work. Portland cement in paper bags, car lots f.o.b. Wilmington \$1.39, car lots on the street, \$1.44; smaller lots on street, \$1.54. In duck, 25c. per bbl. more. †††Layrairie pressed, 54; Metropolitan, 42; Massillon, 42; Scorial, 43. First cost, \$20; second, \$41; third, \$38; fourth, \$43.50; delivered in yards or on streets. None but scorial brick laid for several years. §§\$1.21 to \$1.34, including macadam foundation: \$1.27, including flat brick foundation. Excavation not included. \*\*\*\*About 25c. additional for delivery. ††††Sand for filler and cushion, 85c.

For the above table we are indebted to the American Society of Municipal Improvements. The data were collected from its members by the Secretary, for the Clearing House of Municipal Information, which has been established by the society to enable its members to collect general information concerning all branches of municipal works.

## ROADWAY WIDTHS AND EXCAVATIONS

## Arguments Favoring Narrower Roadways, with Side and Middle Parking—Typical Illustrations of Such Construction—Essential Considerations

By GEORGE C. WARREN  
President Warren Brothers Company

I HAVE read with special interest the remarks of Mr. Andrew Rosewater at the convention of the League of Iowa Municipalities, published in "the official organ," *Midland Municipalities*, for November, 1907, and the paper of Mr. Stephen Child on this subject in *MUNICIPAL JOURNAL AND ENGINEER*, issue of January 1, 1908. At the expense of writing against my commercial interests as a paving contractor, whose interest is along the line of more pavements, "the wider the better," I wish to subscribe to Mr. Rosewater's excellent suggestion that the paved width of roadways should be narrower (sometimes much narrower) than is customary in many sections of the country, especially on residential streets, and to add a few thoughts which occur to me.

The matter of custom as to width of streets varies very greatly geographically. Generally speaking, in the newer sections of the South and West streets have been laid out very wide between building lines, and this has been followed by a pretty general sentiment and demand for excessive width of pavement. Within the past year, in a city of about 10,000 population, which has streets 100 feet between building lines, sidewalks 6 feet to 8 feet wide and the balance of the width (say 85 to 90 feet) graveled, I modestly suggested that it would be a stroke of economy as well as artistic beauty in preparing for pavements to provide widths between curbs about as follows:

All streets 100 ft. wide between building lines:

*Business streets with double tracks.*

Sidewalk width, 10x2 ft.....	20 ft.
Grassed parkway in center in which the tracks are laid .....	30 ft.
Paved roadway each side of parkway, 25x2 ft.....	50 ft.

100 ft.

*Residential streets with double tracks.*

Sidewalk width, 6x2 ft.....	12 ft.
Grassed lawns between curbs and walks, with shade trees and tracks, 10x2 ft.....	20 ft.
Grassed parkway with or without flower beds and shade trees in center .....	32 ft.
Paved roadway each side of parkway, 18x2 ft.....	36 ft.

100 ft.

*Business streets without car tracks.*

Sidewalk width, 10x2 ft.....	20 ft.
Grassed parkway with or without flower beds and shade trees in center.....	30 ft.
Paved roadway each side of parkway, 25x2 ft.....	50 ft.

100 ft.

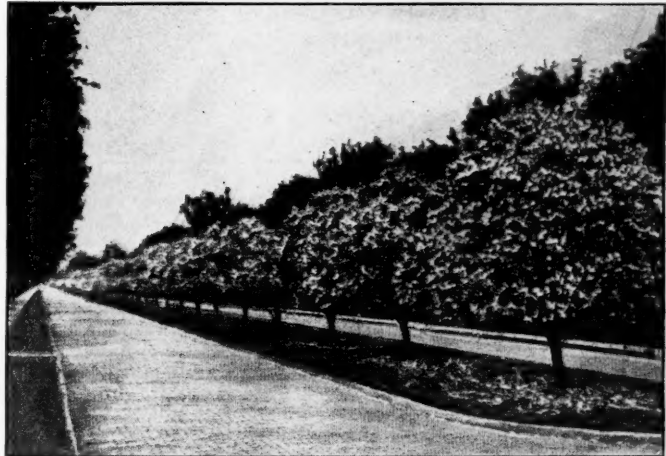
*Residential streets without railroad tracks.*

Sidewalks, 6x2 ft.....	12 ft.
Lawns with shade trees between sidewalk and curb, 10x2 ft.....	20 ft.
Grassed parkway in center with or without flower gardens and shade trees .....	32 ft.
Paved roadway each side of parkway, 18x2 ft.....	36 ft.

100 ft.

I was told in no unmistakable terms that the people want wide streets, and that if I didn't drop "the idea of

reducing the width of roadway to the dimensions of a country road" I might as well give up the idea of doing any paving in the town, for "the people won't stand for it." Of course I succumbed and was quite willing to accept a largely increased area of paving instead of the more economical plan covered by my suggestion.



OXFORD STREET, ROCHESTER, N. Y.

Showing magnolia trees in bloom in 20-foot parkway; 18-foot roadway, 10-foot lawn and 5-foot sidewalk on each side. Total width, 86 feet.

In a number of cities, particularly in Rochester, N. Y., it is quite a common practice to lay out residential streets with narrow roadways on either side of beautifully kept parks of grass and flower beds in the center. Oxford street, Rochester, N. Y., is a typical example of this plan, on which there is a 20-foot parkway with an 18-foot roadway on either side, with 10-foot lawns between the roadways and the sidewalks, the total width of the street being 86 feet.

Generally in cities throughout New York, Ohio, Indiana, Michigan and other middle Western States it is the custom to provide comparatively narrow paved areas



BROAD STREET, COLUMBUS, O.

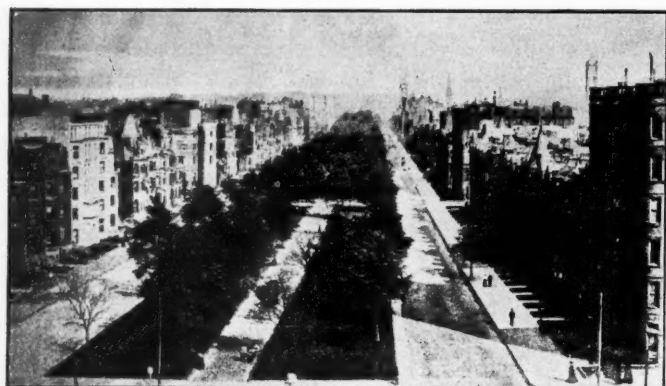
Lawn from lot line to sidewalk, 4 ft. each side.....	8 ft.
Cement sidewalk, 8 ft. each side.....	16 "
Lawn between sidewalk and roadway, 8 ft. each side.....	16 "
Macadam roadways, each 15 ft.....	30 "
Two parkways with trees, each 8 ft.....	16 "
Asphalt roadway in middle.....	34 "

Total width.....120 ft.

in the center and lawns and shade trees between the curb and sidewalk.

Broad street, Columbus, Ohio, is a beautiful example of a wide parkway, with two rows of shade trees in the cen-





COMMONWEALTH AVENUE, BOSTON, MASS.

Two 15-foot sidewalks, two 35-foot roadways, and 100-foot parkway containing 18-foot walk in the center, with trees and statuary. Total width, 200 feet.

ter, paved roadways on either side of the parkway, and lawns with shade trees between curb and walk.

Commonwealth avenue, Beacon street and other boulevards in Boston and its suburbs are excellent examples of railroad tracks and shade trees in neatly grassed parkways in the center.

Lake Drive, Rochester, N. Y., leading to the popular lake resort, Charlotte, is an example of railroad tracks in lawns on either side of the roadway.

Park avenue, New York City, is a good example of parkway in the center and paved roadways on either side in a street of a large city which is solidly built from street to street with blocks of houses extending to the street line.

As Mr. Rosewater well points out, railroad tracks through the paved roadway are a serious menace to the utility, durability, cost of construction and appearance of a city. Unless the paved area outside of tracks in the center of the roadway is of considerable width (say at least 18 feet, making total width of roadway between curbs 50 feet) the traffic is so concentrated in narrow strips each side of the tracks as to many times increase the traffic per foot of width of strips carrying the bulk of the traffic, consequently increasing the wear and tear of the pavement and causing it to wear in ruts. It is far more artistic, as well as more economical in first cost and in cost or repair, to place the tracks in grass plots either in the center or the sides of the roadway, as suggested above. To accomplish this, however, the width of street between building lines must be greater than obtains in many cities.

In Utica, N. Y., most of the residential streets, which are 60 to 66 feet in width between building lines on streets without railroad tracks, are laid out with paved roadway 26 feet in width and sidewalks 4 feet to 6 feet wide. This leaves lawns at the sides, in which there are generally large elm trees between 11 feet and 16 feet in width. This provides a beautiful as well as economical arrangement.

A typical example of this plan is Clinton Place, Utica, N. Y., as follows: Paved roadway in center between curbs 25 feet; grass plot, with shade trees on each side, 11 feet 6 inches, and 6-foot sidewalks, with houses set back about 15 feet from the fence line, the total street width being 60 feet.

If such a street (60 to 66 feet between building lines) has either a single or double track, if the tracks are not put in the lawns at the sides, it is necessary, in order to provide the best results, to sacrifice the lawns so as to provide a width of pavement between tracks and curb of not less than 18 feet, making in case of double-tracked streets a paved width of 50 feet between curbs and leaving only 10 feet to 16 feet on each side for lawns and sidewalks.

With any given width of residential street between fence or building lines the essential points for consideration in determining the plan for paving are:

1st. The general character of street and width of space between fence line and the buildings.

2d. The width of roadway necessary to accommodate the traffic.

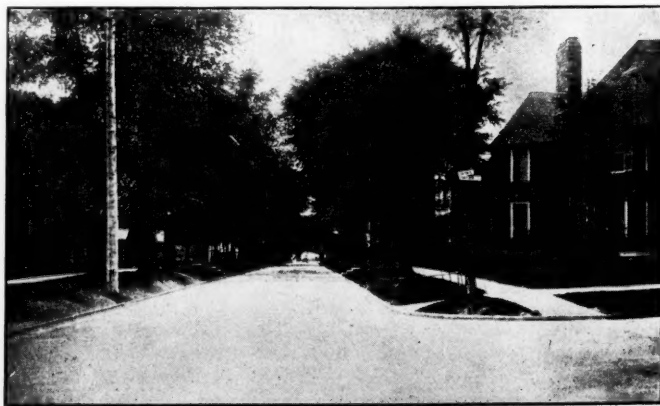
3d. Cost of construction.

I place the essentials in the order of importance as they appear to me. There is nothing adds more to the appearance, durability and consequent value of the property than a well-balanced, artistic arrangement of the available space, and cost is the least important of the important considerations. In my judgment a street with a paved roadway as narrow as 18 feet or 20 feet, although ample to carry the traffic on an ordinary residential street, has too cramped an appearance, unless it be on a very narrow street with buildings close to the street line.

On the other hand, in my judgment a roadway on a residential street without car tracks, having a paved width of 60 feet, is too wide to give the best results in either appearance, and consequent value of the property, or economy of cost on any street, unless it is very wide, with fine residences set well back from the street. Even then a parkway in the center and two roadways, each 25 feet in width, would be much preferable.

Mr. Rosewater suggests subways on either side of the street for carrying sewers, water mains, electric conduits, etc. That is an excellent idea in cases where practicable, and where the building of such conduits would not destroy old shade trees, the existence of which, if artistically arranged, adds more to the appearance and comfort of a street than any other possible feature.

Even where such a conduit is not practicable, it is often quite practicable and best to put sewers (except trunk sewers), water mains, gas mains and electric conduits at



CLINTON PLACE, UTICA, N. Y.

Typical narrow residence street with lawns and trees at the sides. Roadway, 25 feet; lawns on each side, 11½ feet; total width between property lines, 60 feet.

either side of the street, and this should be done far more frequently than is now done. Given a street having a width 75 feet between building lines, and lots having a frontage of 40 feet; then, with these utilities under the sidewalks—say 3 feet from the building line—we have, in linear feet of main and lot lateral extended back to the building line, in each 1,000 feet of street:

Mains,	1,000x2 = 2,000 ft.
Lot laterals,	100x3 = 300 ft.

Lot laterals and mains, total,	2,300 ft.
--------------------------------	-----------

With the utilities in the center we have:

Mains .....	1,000 ft.
Lot laterals, 100x37½.....	3,750 ft.

Lot laterals and mains, total.....	4,750 ft.
------------------------------------	-----------

It is true that one main costs less than two of the same aggregate capacity, but this difference is nearly, if not fully, made up by the saving of one-half the trenching and the saving of over 85 per cent. of the lot lateral service pipes. Without figuring accurately on the matter (the ratio would vary with sizes of mains desired), it is believed that in the long run the dual main system under the walks would be lower in first cost, and would be infinitely more economical in utility and cost of repairs to pavements, than the present system of putting the mains in the center.

#### Parking a Marsh in Worcester

AN interesting undertaking, upon which the Engineering Department of Worcester, Mass., has been engaged during the past year, is the improvement of Beaver brook. This stream runs through a stretch of marshy land which was frequently flooded and was the breeding place of mosquitoes. It was decided to confine the brook to a channel and at the same time drain the marsh. The idea was advanced that this afforded an excellent opportunity to add to the city's park system, at little expense, a strip along the sides of this channel, and the plans were made accordingly.

The stream has been diverted from its original course to some extent. The sides and bottom are paved with Marlborough granite blocks. The bottom is made from 14 to 18 feet wide and the sides rise 4½ feet above the

bottom on a 1½ to 1 slope, this slope being made thus flat to enable children to climb out should they accidentally fall into the stream. On one side, adjoining the paved curb, will be a sodded strip 3 feet wide, with a 6-inch rise, and beyond this an 8-foot sidewalk. On one side will be a 30-foot driveway, separated from the sidewalk by a 3-foot strip of sod. The parking thus formed will be approximately a mile long and will be accessible from all the intersecting streets. One section of this work was completed last year and the remainder will probably be done this year.

In order that the water level in the brook may be maintained during the summer droughts, folding dams are to be used. When the stream flow is small these dams will be raised to place and will maintain a minimum depth of 18 inches of water, while during floods they will be folded to the bottom so as not to impede the flow of the water.

#### Paving in United States. Additional Data

As stated on page 273, since the tables of Paving in the United States were prepared and the summaries of them made further reports have been received. Information concerning paving to be constructed was added on page 272; that concerning paving now in use is given below.

In the tables the following mistakes and omissions have been discovered. We will be grateful to any of our readers who may find others if they will notify us at once:

Table I.—Cambridge, Mass.: 12,138e should be 12,138f. Springfield, Mass.: 22,25d and 4,590e should be 2,225d and 4,590e. Albany, N. Y.: 2,277 should be 2,277. Allentown, Pa.: 9,24b should be 9,24b; 26,208 should have an *a* attached; there should also be added 8,84g and 29,733f. Rochester, N. Y.: 13,05a should be 13,05a. Solvay, N. Y.: 3,451 should be 3,451. Brookville, Ind.: 3,000 should have a *g* attached. Winchester, Ind.: 0.77 should have an *a* attached. Saginaw, Mich.: 0.72 should have an *a* attached.

Table II.—An *a* should be attached to the following: Berea, O., 21,028; Chillicothe, O., 2,975; Conneaut, O., 7,650; Danville Ill., 0.35; Fulton, Mo., 10,000; Ft. Scott, Kan., 8,000. Bowling Green, O.: 0.59 should be 0.5g. Auburn, Ind.: 20,000 should have a *b* attached. Colorado Springs, Colo.: 35,000 should have a *g* attached.

NAME OF CITY	WORK DONE IN 1907			Kind of Foundation Used	Kind of Filler Used	Guarantee Required	TOTAL AMOUNT IN 2 CITY AT PRESENT	
	Miles	Sq. Yds.	Cost				Miles	Sq. Yds.
Jerseyville, Ill.....	1.48a	23,443		5" Portland.	Asphalt...	*		23,000a
Minneapolis, Minn.....	1.90d	30,096		5" Portland.	Cement....	*		338,030a
	6.46e	102,327		5" Portland.	Pitch.....	*		164,447b
	1.30g	20,592		Sand.....				569,655d
								327,697e
								213,297g
								223,561u
Green Bay, Wis.....		2,540a	\$5,846	6" Concrete.				14,000a
	1.5b	22,400	58,600	6" concrete.		5 years....	4g	60,400b
		6 6559	8,650			5 years....	3½e	
Oklahoma, Okla.....	9.88b	152,000	490,000	6" concrete.	Cement....	10 years....		500,000b
Seattle, Wash.....	1.6a	37,110	216,939	Concrete....				172,475a
	11.47b	84,961	511,619	Concrete....				607,771b
	2.58d	34,147	256,572d					5,570c
								47,480d
								4,360e
								25,405g
Visalia, Cal.....								19,845b

\*Work done by city.

### Resurfacing a Cambridge Street

As shown in the large table of paving statistics in this number, the city of Cambridge, Mass., has employed a considerable variety of paving materials upon its various streets, in general attempting to adapt the pavement to the traffic. "There is probably no street in the city," says Geo. M. Clukas, Superintendent of Streets, in his report for 1907, "where there is such a volume of traffic or where there are more automobiles passing every day (than Massachusetts avenue), and it became necessary to lay a pavement there which would not only carry the heavy traffic, but which would resist the action of automobiles on its surface. The character of the street eliminates the possibility of paving either with vitrified brick or granite blocks, and it was finally decided to lay Hassam pavement there. This pavement has been recently laid in Somerville and a number of other cities with very good results. It is composed of cracked stone and Portland cement. The old Telford foundation, which was laid on this street in 1898, makes a splendid foundation for this pavement, and there seems to be no reason to prevent its lasting very many years. The work of excavating the street to its sub-base, six inches below the completed surface, and the spreading of the first course of cracked stone was all done by the employees of this department. The two-inch top surface was laid by the Simpson Brothers Corporation under a contract guaranteeing its maintenance for the next five years. The entire work has been most satisfactorily performed, and the cost per square yard has been very much less than our original estimate. From the top surface a number of streets in the vicinity of the avenue in North Cambridge were resurfaced, and every particle of material has been carefully and economically distributed."

### Legal Decision Concerning Bitulithic

JUDGE HENRY A. SWAN, of the United States Circuit Court for the Eastern District of Michigan, has recently rendered a decision in the case of Warren Brothers Company vs. the City of Owosso, Mich., for infringement of one of the patents owned by that company covering bitulithic pavement. A similar suit was brought against Muskegon, and, although the two are in different districts, by agreement of counsel they were argued before the same judge at the same time. It is presumed, therefore, that the same decision will be given with reference to Muskegon. This suit was brought several years ago against these cities because of a pavement laid for them by the Barber Asphalt Paving Company, which was claimed to be an infringement of a bitulithic patent, and that company has defended the suit for these towns. The patent involved was No. 727,505, dated May 5, 1903, for "a bituminous street pavement structure containing mixed mineral ingredients of such grades as to give the structure an inherent stability." The Warren Brothers Company states that this is but one of thirty patents owned by it covering the various methods, processes, machinery and appliances used in the construction of this

pavement, most of them granted since the patent in suit was applied for.

The defendant denied the validity of the patent, and also that any infringement of the same was shown under the facts of the case. In handing down his decision the judge submitted no written opinion or oral reason for the dismissal of the bill of complaint, the only statement of the court which would appear to express his conclusion being the following: "This cause having been heretofore duly argued by counsel for respective parties upon pleadings and briefs, and due deliberation having been theretofore had, it is by the court now here ordered, adjudged and decreed that the bill of complaint of the said complainant be, and the same is, hereby dismissed with costs in favor of said defendant to be taxed, and that said defendant have execution therefore." As it was well understood that this case would be taken to the Circuit Court of Appeals, and probably to the Supreme Court, whichever way it was decided, it is probable that the district judge concluded to allow the case to be taken to the Appellate Court for trial *de novo*, without prejudice to either party.

The decision leaves it uncertain whether the patent is invalid, or whether, if valid, pavement like that laid at Owosso could be constructed without infringing the same. The defense asserted that the patent was invalid as covering any bituminous concrete with a properly graded dense and therefore inherently stable aggregate, producing evidence to show that the principle of grading the aggregate involved was known prior to the date of the Warren patent, and that the Barber Company had, as early as 1896, which was five years before the Warren patent was applied for, constructed and laid a bituminous concrete pavement involving the same principles in grading the aggregate. The plaintiff stated that the instance relied upon in this proof was a sidewalk laid in front of the Barber Asphalt Paving Co.'s office in 1896, and a cover laid over the Esplanado at Fort Totten, no effort having been made to show that such construction had ever been used in a roadway by any one prior to the invention of the Warren patents, and that this does not constitute evidence of the laying of "a bituminous concrete pavement involving the same principles, etc."

This decision leaves the matter very indefinite. It undoubtedly casts a shadow over the claims made for the Warren patent and implies that a pavement similar to that constructed at Owosso is not subject to the payment of a royalty to the Warren Brothers Company. It does not, however, make it at all clear just what can be done by other cities in the way of constructing bituminous macadam without infringement, since, even if this one patent is invalid, there are still several others held by the company which are not covered by this decision. The company has other suits pending against the city of Duluth, Minn., where the infringement of three additional patents is claimed. Until the Supreme Court has passed upon these, the exact rights of municipalities and the Warren Company, respectively, relative to this kind of pavement will not be finally settled.



## NEWS OF THE MUNICIPALITIES

**Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance**

### ROADS AND PAVEMENTS

#### Permanent Force of Inspectors

Brooklyn, N. Y.—John C. Sheridan, Chief Engineer of the Highway Bureau, has recommended that the present system of employing paving inspectors by the day be abolished and that instead men be employed by the year at salaries of \$1,350 each. The number of inspectors would be reduced so that the cost to the city would be no greater and the political character of the appointments, now so objectionable, would be done away with.

#### New Form of Contract

Fort Worth, Tex.—Provisions of a contract between the Texas Bitulithic Paving Company and the city of Fort Worth have been agreed on. The clauses requiring a forfeit of \$25 per day for each day's delay beyond the thirty-day limit were retained; the amount to be laid in each month is 10,000 square yards. The company sought to require the city to pass ordinances and resolutions necessary to give it a lien on abutting property where paving is laid. The city refused to guarantee to assist the company in collecting its debts, but City Attorney Sidney Samuels has agreed that the company may present for consideration ordinances and resolutions such as are lawful for the City Commission to pass. The contract is for 117,000 square yards, but the work cannot proceed until the written consent of seventy per cent. of the property owners is secured.

#### A Giant Causeway

Galveston, Tex.—Progress is being made in the scheme for the building of a two-mile causeway across Galveston Bay to connect the city of Galveston with the mainland. The steam railroads entering the city have been ordered by the Texas Railroad Commission to build a concrete causeway. The city and county desire a highway for teams and trolleys. Estimates made by Gen. H. M. Roberts in behalf of the city call for a structure to cost \$1,150,000. The railroads favor a wider and more expensive structure, which would cost \$2,000,000 or perhaps \$3,000,000. If a compromise plan is not agreed on two causeways will have to be built.

#### Large Paving Projects

Newark, N. J.—To provide work for the unemployed as quickly as possible, the Street Committee of the Board of Works, in a conference with Chief Engineer M. R. Sherrerd, fixed upon a list of nineteen streets to be paved as early as the weather permits. This work is to be done by the assessment law, limiting the expenditure to \$500,000. Besides this the proposition to repave Broad street, the principal thoroughfare, which is nearly a hundred feet wide, for a distance of nearly a mile and a half was discussed. Some smooth paving material is desired, and the cost, amounting to \$700,000 or \$800,000, would be paid for by special financial arrangement.

#### A Proposed Boulevard

Petersburg, Va.—A plan has been prepared by Capt. John W. Hays for a boulevard to be built from the heart of the city to Butterworth bridge. The boulevard is to be 100 feet wide, graded, paved, watered, parked and illuminated in such manner that when completed it shall not be surpassed in utility or beauty. Granolithic walks, 10 feet wide on each side of the street, with 22.5 feet of parking to the curb, and roadway 35 feet wide, is the scheme for the suburban section,

while in the business section the sidewalks are to be 20 feet wide and the roadway 60 feet. The lighting is to be accomplished by means of clusters of incandescent lamps upon ornamental posts fed by underground wires. It is not proposed to do all the work at once, but to acquire the right of way and grade it first, then improve it gradually in sections.

#### To Assess Gas Laterals on Abutting Property

Newark, N. J.—The Legislative Committee of the Board of Works recently visited Trenton to urge upon the Legislature a measure permitting the Board to construct gas laterals in anticipation of paving work and assess the cost upon the benefited property owner. Such a law would put the Board in a position to comply with the law of 1906 requiring that no street pavement be torn up within five years of the date it was laid.

### SEWERAGE AND SANITATION

#### An Expensive Section of Sewer

Boston, Mass.—A section of the metropolitan sewer now in course of construction in the Brighton section will cost \$95,000 for a quarter of a mile—a little over \$70 a foot. A shaft was sunk for a depth of 65 feet below street level, for the most part through trap rock, and then the headings were started. The work is going on night and day in eight-hour shifts. Twenty men in each shift work by the light of 100 incandescent lamps. Blasting is done at 6:30 morning and evening.

#### Mosquitoless City in Jersey

Jersey City, N. J.—Pursuant to its work of mosquito prevention, the Board of Health in letting a contract for ditching the South Shore meadows has arranged for the draining of every bit of meadow land in Jersey City. Last year the lowlands on the west side of the city were drained and the work was most successful in preventing mosquitos from breeding.

#### Disposal Plant or No More Sewers

Lockport, N. Y.—Several petitions for sewers have recently been denied. Some time ago the State Board of Health sent a communication to the Mayor forbidding the building of any more sewers in the city until arrangements had been made for disposing of sewage in a sanitary manner.

#### Unsanitary Buildings Removed

Pawtucket, R. I.—In accordance with a recommendation of the Superintendent of Health, the Board of Aldermen has ordered four buildings on Pleasant street torn down on account of lack of sanitary arrangements in the houses and back yards. The premises have been for years, according to the Health authorities, the center of vice, vermin and loathsome disease—sources of expense to the city, annoyance to the public and a probable center of crime.

#### Pittsburg Must Build Sewage Disposal Plant

Pittsburg, Pa.—The State Board of Health has given the city a command that will eventually lead to the expenditure of \$10,000,000. Temporarily the Board has ordered that the city prepare plans for a sewage disposal plant; later an order will be given to build the plant. Storm water and house drainage will have to be separated. Most of the sewage will probably have to be pumped to some point outside the city.

### Complete Sanitary Code

Syracuse, N. Y.—An ordinance comprising a new sanitary code and health regulations, adopted by the Council, is now being published, occupying nearly four columns of a daily newspaper. The code contains twelve sections and many subdivisions. The first and second sections define the terms used in the ordinance. Section 3 defines the duties and powers of the Commissioner; Section 4 deals with nuisances; Section 5 with contagious diseases; Section 6 with vital statistics; Section 7 public nuisances and unsanitary conditions; Section 8 licenses and permits; Section 9 sale of milk and cream; Section 10 sale of ice and food; Section 11 penalties; Section 12 date for going into effect.

### Sewer Empties Into Water Shed

Tacoma, Wash.—That a sanitary sewer is being allowed to empty into Gallagher gulch, where the springs are located, from which the city's low service mains are partially supplied, was the nauseating information recently brought to light. In order to relieve a sewer that was overloaded a hole was knocked in an exposed portion along one side of the gulch. It is stated no water is used from Dam No. 2, into which the stream empties, except for the purpose of running a water ram, but the Council prefers to have the sewage conducted to tidewater.

### Cats as Well as Dogs May Be Taxed

Washington, D. C.—The Commissioners are considering the question of asking legislation permitting them to increase the tax on dogs and also to tax cats. They consider that the custom of keeping cats and dogs in a city is a menace to the health of the community. According to letters received from citizens those favoring a heavy tax are in the majority. However, before taking action, Commissioner H. B. F. Macfarland and his colleagues will secure and compile information from other cities in this country and abroad.

### WATER SUPPLY

#### Fire Affects Election for Water Bonds

Barnesboro, Pa.—Barnesboro's fatal fire, while it saddened the community over the loss of a human life, was beneficial in affecting the election in favor of the proposition to bond the borough for \$17,000 with which to install and equip a water pumping and distributing plant. Coincident with this is the move, now pending in court, to secure an annulment of the borough's agreement with the local water company. It is charged that the company has been trying to cover too much territory, as a result of which the borough has suffered. At the blaze the pressure was so weak that the water could not squirt out more than a few inches from the nozzle of a hose. It was this which gave the fire its start, entailing the destruction of much valuable property.

#### Universal Meter Rate Adopted

Duluth, Minn.—The Board of Water and Light Commissioners have voted to adopt a resolution abolishing all flat rate assessments for water consumption and establish universal meter rates. The rate is 17½ cents per 100 cubic feet—43 gallons for one cent.

#### Will Investigate Filtration Systems

Evansville, Ind.—The Council having determined to filter the city water, is determined to have sufficient advice on the subject. Fred W. Witherell, Sanitary Engineer of Pittsburgh, Pa., has been consulted and will submit general specifications. Owen Ford, of St. Louis, Mo., has also looked over the ground. In addition to all this, a committee will go to Ownesboro, Ky., to inspect the Smith-Grote sand bed filtering system there. A few weeks ago Council voted to install a mechanical filtration plant.

### Fight Against Private Water Companies

Jersey City, N. J.—The Street and Water Board recently held a conference with Water Register John J. Hickey, of Bayonne, in reference to the water supply question, and steps were outlined in the fight of the Hudson county municipalities against the East Jersey Water Company and other private companies. The latest plan is for Bayonne to declare its contract with the private companies void and arrange for a supply from Jersey City's reservoir at Boonton. Mayor H. Otto Wittpenn hopes that Jersey City will win back its profitable customers, including Harrison, Kearney and East Newark.

### Water Consumption Low in January

Malden, Mass.—The monthly report of the Metropolitan Water Board shows that every city and town in the district with the exception of Stoneham, Belmont and Swampscott used less water in January than they did a year ago, the reason being that the weather during the month was so mild that water was not wasted by consumers to prevent freezing. The city of Malden used less than one half as much as any other city, the average per inhabitant in January being 41 gallons.

### Wins Against Water Company

Tarentum, Pa.—Tarentum has won its fight against the Allegheny Valley Water Company. The company accepted the Borough's terms and Council granted a 20-year franchise. Water will be supplied to fire plugs at \$10 a year each. The plugs will be furnished by the Borough and placed by the water company.

### Would Purchase Private Plant

Tulsa, Okla.—Pursuant to the repeated demand of the city, the Tulsa Light, Water, Heat and Power Company has made a definite proposition to sell its plant to the city for \$172,000. The matter will have to be submitted to popular vote, and an additional amount of \$75,000 will be required to improve and extend the works.

### Water Works Pays First Profit

Valdosta, Ga.—For the first time in its history the municipal water works made a profit—a balance of about \$1,000 being turned over to the city treasury. The principal reason for the difference is that less water than usual was pumped, 100,000,000 gallons against 150,000,000 for the year before. Besides new machinery reduced the coal consumption to 5.7 tons a day, and effected a saving of a dollar a day in fuel. The receipts of the department were \$11,100.

### STREET LIGHTING AND ELECTRIC POWER

#### Boulevard Gas Lamps Adopted

Baltimore, Md.—Superintendent of Lamps and Lighting McCuen has announced that the boulevard type of street gas lamps will be substituted for the present Miner style on most of the prominent streets of the city and at the same time all street gas lamps are to be equipped with a "draft tube" which aids in giving a brighter light without the use of additional gas. The new form of lamp is being supplied at the same price as the old, \$10.85 a year.

#### Buffalo Considers Municipal Lighting

Buffalo, N. Y.—At a conference of members of various commercial and civic bodies, the subject of municipal ownership of an electric lighting plant and conduits was argued at length and not without some heat. The substantial result was that a committee composed of two members from each of the civic bodies was appointed to consult with Mayor J. N. Adam.

### Light from Darkness

Galena, Ill.—Dissatisfied for some time with the local service, the Council met to receive a report of a committee which had conferred with the local officials of the electric company. The promise of excellent service in the future, which the committee had to report, presumably would have prevented decisive action. Opportunely, however, all the electric lights went out, and, with such assistance as lanterns and oil lamps could afford, a motion was unanimously carried to authorize the city attorney to draw up an ordinance for an issue of bonds for a municipal electric lighting plant.

### Gas Franchise Annulled

Grand Forks, N. D.—An ordinance has been passed repealing the franchise of the Grand Forks Gas and Electric Company. An official of the company was present and gave figures tending to show that the profits of the business were very moderate. Not much credence apparently was given to the statement and a bitter fight is looked for. Failing to bring about a reduction in the price of gas by argument, the Council will now go ahead and fix the rates. The company threatens to close the plant rather than submit to dictation.

### Electrical Inquiry in New York

New York, N. Y.—The Public Service Commission has begun its investigation of the electric lighting companies. No attempt will be made by the Commission to delve into matters concerning the organization or capitalization of the different electric lighting companies, but the investigation will be devoted almost entirely to the methods employed by the companies in the conduct of their business and to the complaints that the companies are in the habit of making discrimination in rates. Other matters to which the Commissioners will give attention are the legality of the custom of the companies in requiring the signing of contracts as a condition of service; whether or not the prices charged for electric lighting are reasonable; what provisions the companies make for emergency services and the steps taken to insure the accuracy of meters. Seventeen companies have been summoned to appear before the Commission.

### FIRE AND POLICE

#### Police Pensions at Lockport

Lockport, N. Y.—The police have circulated a petition and will submit it to the Police Board asking the Board to establish a pension system. Each patrolman agrees to give two per cent. of his annual salary to the fund. It is expected, however, that the Police Board will take steps to raise additional money to make the total of the fund enough so that the superannuated will receive a fair income. There is already \$900 in the hands of the Police Chief which was collected from the dog license tax, which will be a starter for the fund.

#### Preventive Measures Follow Fire

Portland, Me.—At a meeting of the City Council an appropriation of \$25,000 was authorized to install a combination manual and automatic fire alarm service, and the City Council went on record as favoring the construction of a fireproof building in which to place the Electrical Department of the city. The Committee on Fire Department was also asked to report relative to increasing the number of permanent firemen in the city.

#### Use of Armories by Police and Firemen

Springfield, Mass.—A bill has been introduced in the Legislature on the petition of Mayor Sanderson to permit the use of State armories by the police and firemen for drills and dancing assemblies for the beneficiary associations, with the consent and approval of the proper military authorities. The bill was urged mainly on the ground of Springfield's specific need since the burning of the City Hall. There appears to be

no opposition to the bill, which is required owing to a ruling of the Adjutant General that the use of State armories by police and firemen is not permissible under the statutes.

### Legislation for Firemen

Trenton, N. J.—Two firemen's bills have been introduced in the Legislature by Senator Robbins, to which there is little or no opposition. One appropriates to the pension fund in Jersey City, Newark, Paterson, Trenton and Camden and other cities, as soon as they have fully-paid Fire Departments, all of the two per cent. tax levied upon fire insurance companies doing business in the State. The other bill amends the act of 1875 creating exempt firemen's associations and provides that the auditor of the association be paid out of the State insurance tax, thus making him a State officer. John S. Gibson, who is also Secretary of the Passaic Valley Sewerage Commission, at present holds the position.

### Stone Clogs Fire Hose Nozzle

Upper Montclair, N. J.—At a recent fire it was impossible to get water for the engines until after ten minutes. The reason for the trouble was discovered later. A stone as large as a man's fist had fallen into the water conduit when a house connection was made. This was forced by the heavy pressure into the hose and finally into the nozzle, where it completely blocked the flow. When a new nozzle was put on a heavy stream was obtained, not, however, until the residence had been destroyed.

### Glass Door Key Boxes Increase False Alarms

Youngstown, O.—In his annual report, Fire Chief W. H. Loller states that the Department responded to 368 alarms, a number exceeding by 46 the record of any previous year. Forty of the alarms were false. The Chief says that the fire alarm stations, equipped with glass door key boxes to facilitate quick communication with the Department, present to thoughtless or malicious persons the temptation to send in false alarms.

### GOVERNMENT AND FINANCE

#### Economy the Rule in Boston

Boston, Mass.—Mayor George A. Hibbard's budget, asking in all for his departments \$565,844 less than was asked by Mayor John F. Fitzgerald a year ago, has been sent to the Common Council with a brief letter urging economy in appropriation. The total asked for is \$11,817,105, which, with sinking fund requirements and county debt expenses, amounts to \$18,110,735. The department estimates were reduced \$2,544,858 by the Mayor. The amounts allowed for four departments exceeded those of last year, namely, Art, Fire, Board of Appeal and Police.

#### Irregular Procedure in Public Expenditures

Lewiston, Me.—An injunction has been granted restraining Mayor Frank A. Morey from spending on his own authority the public money in the care of streets. Under the ruling of the court the City Council will appropriate the money and the Public Works Commission direct the expenditure of it.

#### Legality of Municipal Contracts

Louisville, Ky.—Mayor Grinstead, in accordance with the opinion of City Attorney Judge A. E. Richards, has returned to the Audit Company of New York its bill of \$37,970 for investigating the affairs and accounts of the Louisville Water Company. Judge Richards states that the expenditure was not legally authorized because the General Council did not act in the matter. There was the further objection that there was an attempt to create an obligation in one year to be paid out of the revenues of the succeeding year. The attorney adds, "Persons dealing with municipalities are bound, at their peril, to know that their contracts are legal."



### Occupation Tax vs. Liquor License

Oklahoma City, Okla.—Many towns in the new State have had trouble with the occupation tax. It was created to provide a means of revenue to run the city when the saloon licenses, police court fines, etc., provisional by virtue of the saloons, were cut off by prohibition. The legality or constitutionality of the occupation tax will now have to be solved entirely upon its merits. Proceedings have been begun in the courts in a number of cities where an attempt has been made to collect the tax.

### For Public Utilities Bill

Washington, D. C.—There seems to be little doubt that Congress will provide Washington with a Public Utility Commission of some sort, modeled after the New York Commissions. Two bills are being considered, one to create a separate Commission, the other to clothe the District Commission, when sitting as a Public Utilities Commission, with the requisite authority to take action towards settling questions arising between citizens and the public service corporations.

### REFUSE COLLECTION AND DISPOSAL

#### First Spring Cleaning Day

San Antonio, Tex.—Spring cleaning on a big scale has been arranged by the Women's Club for March 10. A fund has been collected for a publicity campaign and thousands of circulars have been sent out preaching the doctrine of sanitation and cleanliness. Covered boxes are being placed in the business part of the town for waste. The Fire Department will flush the streets and sewers, weeds and rubbish will be carted from vacant lots, pools will be drained and cisterns screened.

#### New Way to Dispose of Waste

Scranton, Pa.—William Griffin, a mining engineer, has made a suggestion for providing supports for the roofs of coal mines. The caving in of these mines has given trouble in many towns of Pennsylvania and there is the fear that a greater disaster may occur some time. Mr. Griffin suggests that bore holes be sunk to the abandoned workings underlying the city and that solid refuse be dumped in and flushed down with water. A saving in the cost of hauling ashes might be made by the city and mine owners might be willing to contribute towards the expense of the work for the sake of the safety afforded.

#### No Garbage Monopoly

Hartford, Conn.—In response to a question as to whether the city could give an exclusive contract to one party for collecting garbage, Corporation Counsel Arthur L. Shipman has answered in the negative. He states that such an exclusive privilege could only be given and upheld by the courts under the doctrine of the police power. In other States this has been done, but the decision made by Connecticut courts would not sustain it. When, under the guise of regulating a certain business, a monopoly is practically created, the necessities of public sanitation must demand such a limitation. However, it would be possible to regulate private collectors by the most stringent and exacting methods that modern sanitation require.

#### Oppose Reduction of Garbage Appropriation

San Francisco, Cal.—A proposition to cut down the appropriation for municipal incinerators and accessories from \$1,000,000 to \$800,000 has met with opposition from nearly all the civic and commercial bodies, who have filed a protest with the Supervisors against such action. The argument is that, in order to render efficient service, plants will have to be installed both near North Beach and between the Mission and the Potrero; one in the northern and the other in the southern section of the city.

### Sidewalk Laws Needed

Washington, D. C.—For some time past the District has been powerless to compel householders and business men to keep their sidewalks clean. To bring about reform in this matter, the Commissioners have sent to Congress two measures, one designed to keep the sidewalks free of snow and ice in winter and the other to compel sweeping in summer. Both laws are framed to meet objections raised by the Court of Appeals to the old snow ordinance.

### PARKS AND CITY BEAUTY

#### Gives Away a Thousand Roses

Chattanooga, Tenn.—Walter C. Johnson, an enthusiastic member of the City Beautiful Club, has ordered 1,000 "baby rambler" roses, which will be given away to members of the Juvenile Flower Club, the Vine Street Orphanage and the free kindergartens. Cultural directions for the roses will be given with each plant.

#### Tree Planting Campaign

Denison, Tex.—At a meeting of the Denison Civic Improvement League arrangements were completed for an Arbor Day tree planting campaign, which promises the planting of a large number of shade trees and shrubs in home yards and on the streets. A prize of \$25 has been offered by A. D. Jackson to the school class which plants the most trees.

#### Bill Posting Prohibited at Lynn

Lynn, Mass.—The subject of posting bills on street obstructions and barricades was recently considered by the Board of Public Works. Several instances were related where this practice amounted to a public nuisance. The street, too, became littered with the old posters. It was decided to prohibit the practice.

#### Title to Park Land Disputed

Galveston, Tex.—The question of ownership of nine blocks of ground north of Avenue A and east of Tenth street, raised by the Santa Fe railroad, has been investigated by the City Commission. It appears that when the city was originally laid out the Galveston City Company intended to use the land for a park, but in 1882 the company gave a quitclaim deed to the Santa Fe railroad for this land, refusing to execute the usual warranty deed. As the Board of Aldermen or the municipal government has never possessed authority to dispose of park land, it is believed the land still belongs to the inhabitants of the city of Galveston.

#### Remove Trees to Save Others

Plainfield, N. J.—In carrying out its plans for the care and preservation of trees, the Shade Tree Commission finds that on many of the streets the trees stand too close together, causing the soil to become exhausted, sour and overgrown with moss, making the streets damp, and the trees ill-shapen.

#### Children Plant 5,000 Rose Bushes

Portland, Ore.—Under a clear sky and a June-like sun, thousands of Portland school children, tens of thousands of citizens and visitors of the State participated in one of the most unique Washington's birthday celebrations probably ever held in the country. Five thousand rose bushes were planted in three large park blocks prepared for the purpose. Addresses were made by Governor Chamberlain, Mayor Lane and other officials.

#### Gift of One Hundred Acres for Park

Rochester, N. Y.—Mayor Edgerton has sent a message to Council recommending the formal acceptance of the gift of 100 acres by Miss Frances Baker to Genesee Valley Park. Under the new charter all that is required to accept a gift is an ordinance. Plans for the improvement of the new park addition are being discussed.

**RAPID TRANSIT****Gasoline Cars for Suburban Railroad Service**

Buffalo, N. Y.—Gasoline motor cars will be used on some of the suburban railroad lines about Buffalo. These cars have been operating for some time in Colorado in the vicinity of Denver, where, on account of their peculiar shape, they are familiarly known as "Union Pacific battleships." It is said they give excellent service on suburban lines where many stops are made and effect a big saving in fuel and wear on equipment. A speed as high as sixty miles an hour can be developed.

**Income to City by New Traction Ordinance**

Chicago, Ill.—The city will get \$633,831 as its share of the net earnings of the City Railway Company for the last eleven months of last year. This is computed by the company to mean \$675,000 for a full year. Figured on the accepted basis that the Chicago City will furnish two-fifths and the Chicago Railways Company three-fifths of what the city will get altogether from the traction companies, this means a total of \$1,687,500 as the city's annual income from the two traction companies under the new ordinance. President Thomas E. Mitten, in the first report to his stockholders, at their annual meeting of the operation of the company under the new ordinance, stated that the company would pay 55 per cent. of its net earnings to the city and still make plenty of money.

**New York and New Jersey Tunnel Opened**

Hoboken, N. J.—One pair of tunnels of the Hudson and Manhattan Railroad was officially opened February 25. Power was turned on by President Roosevelt by means of a special wire from Washington. Governor Hughes of New York and Governor Fort of New Jersey, accompanied by many officials and persons interested in the enterprise, inspected the tunnel from a special train. Speeches were made at Hoboken by the two Governors and by President McAdoo of the Hudson Companies and by others. A banquet in New York was given in the evening. The tunnels opened were the northern pair, running from Hoboken to Christopher street, New York, and by a subway under sixth avenue to Nineteenth street. The other tunnels and subways will be opened as fast as completed. On the first day after the opening 45,000 passengers were handled.

**Wants to Sell a Tunnel**

New York, N. Y.—Owing to the litigation brought by the city to test the validity of the franchise to operate the Steinway tunnel under the East river, the Interborough Company has refused to operate it. August Belmont, the principal owner, will formally offer to sell the tunnel to the city for \$7,239,476, which is said to be the actual cost. The Public Service Commission will not purchase it except at cost price as determined by expert accountants. If the city makes the purchase, the New York and Queens Railway Company will offer to operate it under terms to be fixed by the city.

**Municipal Ownership of Trolley Lines**

San Francisco, Cal.—A petition, signed by 14,600 of the electors of San Francisco, and praying the Board of Supervisors to submit to the people at a special election the questions whether the municipality should acquire by purchase the franchises and other real and personal property of the United Railroads, the California-street line, the Pacific and Home Telephone companies, has been filed at the Board's rooms by Daniel O'Connell. As the signatures number considerably over the 15 per cent. of the electorate, the petition, according to the charter, will compel the Board to submit the propositions to the people at a special election not more than six months hence. O'Connell estimates a bond issue of \$5,000,000 will buy everything of value the United

Railways owns in the way of franchises and real and other personal property in San Francisco; that \$1,000,000 will do for the California line; \$1,000,000 for the Pacific Telephone, and \$300,000 for the Home Telephone Company.

**New York Rapid Transit Improvements**

New York, N. Y.—The Public Service Commission has taken steps to improve the subway service by requiring the Interborough company to show cause why all cars using the subway should not have side doors. Another order was issued requiring the same company to show cause why all cars purchased in the future for the elevated lines should not have side doors. The Commission has announced also that it has fixed on a clearance of 14 feet 6 inches, an increase of one foot over the present height, for all subways hereafter to be constructed. This will allow the tunnels to admit standard passenger coaches and may be the means of inducing steam railroads to bid for subway construction and operation. The consulting engineers have reported in favor of reducing the grades from 5 to 3 per cent.

**MISCELLANEOUS****Municipal Flag Adopted**

Easton, Pa.—The city has adopted a municipal flag, said to be a copy of the flag which waved over that town during the Revolutionary war. The flag has thirteen red and white stripes in the upper corner, and the remainder of the flag is blue, with a circle of eight white stars in the center.

**Municipal Improvements Needed**

Jacksonville, Fla.—The Real Estate Board has launched a campaign for the modernizing of Jacksonville. The Board advocates bond issues whereby to enable the making of good roads, the laying out of parks, and the adoption of an adequate drainage system. Every year since 1899 deaths have exceeded births in Jacksonville, and the Board predicts that unless much needed municipal improvements are made and home seekers drawn to their city, Jacksonville will die out.

**Streets to be Renamed and Marked**

Massillon, O.—The plan of renaming and renumbering the streets, as suggested by City Engineer Howald, has been agreed on. All streets running north and south except Erie street will be renamed by numerals, there being an east and west street of the same number. The streets running east and west will not be renamed unless the names are duplicated or some reason is found to exist which may cause inconvenience to the postal authorities. When the streets are named 500 new "Clyde" signs will be put up.

**Voting Machines Discarded**

Oswego, N. Y.—Council has voted to abandon the use of voting machines and go back to the old plan of using ballots. At previous elections objections have been made as to the legality of their use. The project for using lake water was tied up in the courts for three years on account of legal actions that arose from the use of the machines.

**No Rubber Tubes for Gas Stoves**

Pittsburg, Pa.—The Council Committee on Public Safety has recommended an ordinance prohibiting the use of rubber tubing for connections on gas stoves. Councilman Louis Hirsch, the father of the bill, recalled a long list of deaths chargeable to the use of rubber gas tubing which had occurred largely in the poorer quarters of the city. Originally the bill prohibited the use of all rubber tubing, but was amended so as to permit its use in connection with drop lights or portable appliances in factories where standard rubber tubing is used.

**Areaways Prohibited on Business Streets**

Wilmington, Del.—The Street and Sewer Directors have decided to prohibit the construction of areaways on business streets.



## LEGAL NEWS

### A Summary and Notes of Recent Decisions—Rulings of Municipal Interest

#### PATENTED PAVEMENTS IN KENTUCKY

**Campbell vs. Southern Bitulithic Co. et al.**—Where an ordinance for the paving of certain streets provides for bids for the construction of a pavement out of either vitrified brick or bitulithic pavement, the two kinds of pavement are sufficiently brought into competition with each other, so that a contract for bitulithic pavement will be valid, even though it is a patented pavement. The Council of a city of the fourth class may use its discretion as to the kind of pavement which should be laid, and the fact that a bid accepted is for a patented pavement, or that another kind of pavement would be cheaper, is immaterial; and where the Council acts in good faith, without fraud or collusion, and there is no showing of abuse of Aldermanic discretion, or a violation of the statute as to cost, the contract cannot be interfered with by the courts. Where an ordinance submits a proposition for bids on pavement to be constructed either of vitrified brick or bitulithic pavement, the fact that one of two bids for bitulithic pavement is a sham bid would not affect the validity of a contract let to the one making the other bid, if there is a competitive bidding between the successful bitulithic bidder and several bidders on brick paving.—Court of Appeals of Kentucky.

#### PATENTED PAVEMENTS IN WISCONSIN

**Stocking et al. vs. Warren Bros. Co.**—The special charter of Superior, providing that public works shall be let by contract to the lowest bidder, that the Board of Public Works shall advertise for proposals for such work, and that, before advertising, a profile or plan of the work to be done, together with the specifications, shall be placed on file for the inspection of bidders, and that a form of contract, as the same will be required to be executed by bidders, shall be furnished to any prospective bidder, and section 127 providing that, when public works shall have been ordered and the plans containing a description of the work, the material to be used, and such other matters as will give an intelligent idea of the work required shall have been filed for inspection of bidders, bids may be advertised for, require competition between bidders on one plan or process for the pavement of a street, which has previously been definitely determined on by the City Council, and competition between two or more different plans or processes, neither of which is definitely adopted until after the bids are received, is insufficient.—Supreme Court of Wisconsin.

#### DEDICATION OF SIDEWALK

**Jackson et al. vs. McHargue et al.**—Where the owner of a strip of land contracted for the laying of a sidewalk over the same, under a city ordinance requiring the laying of a sidewalk, it amounted to a dedication of the strip. Where for over twenty years that portion of a road within the limits of a city had been maintained as a street, and, though it had originally been a county road, the county made no claim to it or attempted to exercise any dominion over it, the part within the city was a city highway, for improvements of which the city might levy special assessments.—Court of Appeals of Kentucky.

#### REGULATION OF SIDEWALK BUSINESS

**Gray vs. City of Omaha et al.**—Where there is no express power granted to a city to license or regulate the business of constructing artificial stone, asphalt or other composite walks, it cannot be implied from the grant of authority to construct and repair walks of such material and in such manner as the Mayor and Council may deem necessary. The provisions of an ordinance to license and regulate the business of constructing artificial stone, asphalt and other composite walks examined and found unreasonable and void.—Supreme Court of Nebraska.

#### REGULATING HOTEL SOLICITORS

**Emerson vs. Town of McNeil.**—The power conferred on Kirby's Digest, to regulate soliciting persons who arrive on trains for hotels, etc., and by section 5454, to regulate omnibuses, drays, etc., and hotels, or an ordinance passed thereunder prohibiting the soliciting of customers for any hotel, etc., on a depot platform while passenger trains are stopping, is not an interference with any common right, but a proper exercise of the police powers.—Supreme Court of Arkansas.

#### IMPOSITION OF LEGISLATIVE POWER

**In the Matter of the Application of Henry B. F. MacFarland, et al., Commissioners of the District of Columbia.**—The duty of ascertaining the value of the plant of the Washington Gas Light Company and of its future extensions and enlargements, as the basis for increasing its capital stock, is a legislative duty, involving the exercise of no judicial power, in the constitutional sense, and can not therefore be imposed upon the Supreme Court of this District. Under the provisions of Section 5 of the Act of Congress of June 6, 1896, a petition was filed in the Supreme Court of the District by the Washington Gas Light Company for the ascertainment of the value of its plant, etc., as the basis for the increase of its capital stock. Thereafter a petition was filed in this Court by the Commissioners of the District for a writ of prohibition to prohibit the Court below from entertaining the petition of the Gas Light Company. Held, that the duty of ascertaining the value of the plant, etc., was one that could not be imposed upon the Supreme Court of the District, and as the exercise of that power by that Court might possibly result in injury for which there is no other adequate remedy the writ of prohibition would issue as prayed. This Court having appellate jurisdiction over the orders, etc., of the Court below, it is not necessary that an attempt shall have been made to invoke that jurisdiction before it can be said to attach in order to authorize the issue of a remedial writ in aid thereof.—Court of Appeals of the District of Columbia.

#### ACTION ON VILLAGE TREASURER'S BOND.

**Village of Prentice vs. Nelson.**—Where a complaint in an action on a Village Treasurer's bond alleged that he had refused to pay over all moneys in his hands belonging to the village to his successor, in defiance of frequent requests by the village, it sufficiently alleged a demand as against a general demurrer, in the absence of any application for a more specific statement as to how or by what person the demand was made.—Supreme Court of Wisconsin.

#### SPECIAL ASSESSMENT—INJUNCTION

**Merritt vs. City of Duluth et al.**—The validity of special assessments for local improvements ordered by municipal authorities cannot be determined in an action brought by a general taxpayer to restrain the authorities from making the improvement; the basis of the action being that, if the special assessments fail, the expense of the improvement will fall upon the general taxpayers. A general taxpayer has no right of action until an attempt is made to defray the expense of the improvement from the general funds of the city.—Supreme Court of Minnesota.

#### ILLEGAL ISSUE OF BONDS—LACHES

**Schnell et al. vs. City of Rock Island et al.**—Where, after the issuance of municipal bonds in excess of the constitutional limit, taxpayers stood by without protest for 34 years, during which time not only the annual payments of interest were made, but the original bonds had matured and new bonds issued in their place they were precluded by laches from enjoining the city from paying the indebtedness created by the bonds. Where a bill in equity by taxpayers to enjoin a city from paying an indebtedness created by the issuance of illegal bonds showed on its face unreasonable delay in the prosecution of the suit, the defense of laches could be raised by a demurrer, which gave complainants an opportunity to amend.—Supreme Court of Illinois.

#### INJURIES—CHANGE IN STATUTE OF LIMITATIONS

**Mulvey vs. City of Boston.**—An action by a husband against a municipal corporation for the loss of services of his wife resulting from injuries received through the alleged negligence of defendant's servants is an action "for injuries to the person," within Laws 1902, providing that actions of tort for injuries to the person against counties, cities, or towns shall be commenced within two years next after the cause of action accrues. A statute of limitations, since it affects only the remedy, may be made to apply to causes of action which have already accrued; and the time which limitation has to run may be reduced, providing a reasonable time is given after the change to allow an action to be begun. A change in the statute of limitations from six years to two, and allowing thirty days in which to bring an action which accrued more than two years before, is not unconstitutional, as depriving a person of property without due process of law. Where the statute of limitations is changed from six years to two, and such change would bar an action already accrued, an allowance of thirty days in which to bring the action is a reasonable time.—Supreme Judicial Court of Massachusetts.

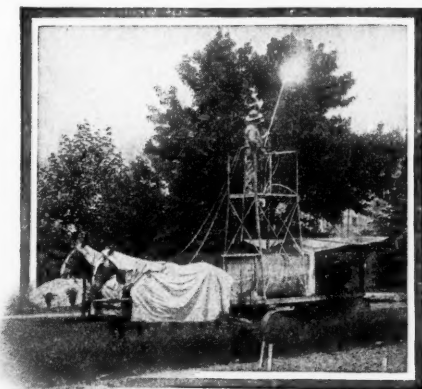


## MUNICIPAL APPLIANCES

### Sprayers for Park Work

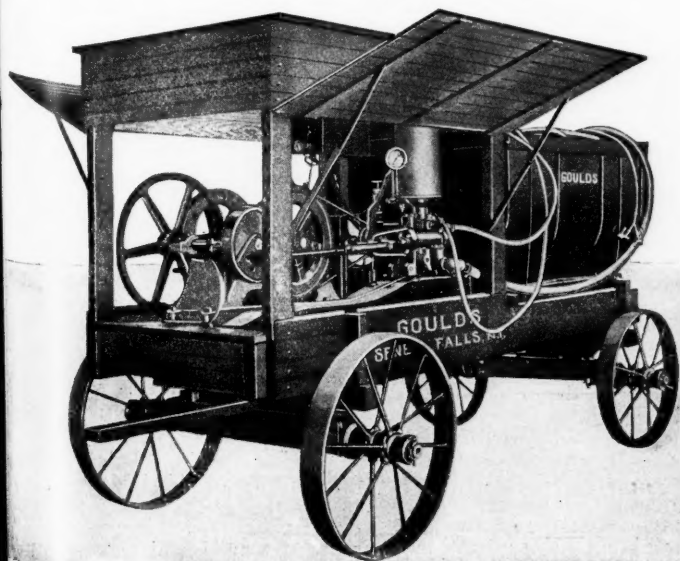
FOR the destruction of injurious insects and fungi on trees and shrubbery, hand and power sprayers suitable for sprinkling germicides and insecticides on the foliage and branches, are manufactured by the Goulds Manufacturing Company, Seneca Falls, N. Y. The first principle of spraying is thoroughness, for a wash carelessly applied is worthless, or, at least, has its value greatly reduced. For this reason, an effective apparatus is important. Moreover, the solutions and mixtures used are

destructive to any but the best machinery. The Goulds triplex power pump is especially adapted for the work. The strokes of the pump follow and overlap each other so as to give an even and uniform flow, a result scarcely obtainable with a single acting pump. The mounting of the pump should be suitable for the purpose. As shown in the cuts, the outfits are constructed either with or without a tower and housing. Speak-



SPRAYER, SHOWING  
TOWER AND HOUSING

ing of power sprayers generally, it may be said that they save much time in spraying, owing to the fact that they are always in operation as long as there is any solution in the tank, thus necessarily keeping the men more active, making it possible to continue the spraying when the team is moving. The outfit having the largest capacity made by this company is the triplex. This consists of a two-horsepower gasoline engine, complete with electric ignition, including batteries, spark coil, cooling tank, etc. A bronze-fitter triplex pump with by-pass, water relief valve, pressure gauge, brass discharge shut-offs with four 25-foot leads of 3-8-inch discharge hose, with couplings, 15 feet of 1-inch suction hose and strainer. The gasoline engine is simple and inexpensive to operate. The pump and engine are direct-connected by reduction gearing and mounted on a cast-iron bed plate 21x36 inches. At the usual speed of fifty revolutions, the pump will deliver six gallons a minute. Bamboo extensions are made for elevating the nozzle. Another outfit, shown clearly in the larger cut, uses the "Vice Admiral" double-acting pump, which may be operated by hand instead of with a gasoline engine, as shown in this illustration. This pump has ample power for spraying and will handle several nozzles at one time. The Admiral sprayer has a brass cylinder of heavy seamless tubing, which is held firmly in the cylinder by threaded connections. It can be removed and replaced when worn out, an important feature, as the gritty nature of many of the spray mixtures has a tendency to cut the lining.



SPRAYER WITH DOUBLE ACTING PUMP

### Cement Curbing Forms and Tools

A COMPLETE line of cement-working tools and machinery, including forms for concrete curb and gutters, are made by the Century Cement Machine Co., Rochester, N. Y. Cement curbing is used in some parts of the country almost exclusively, and, even where cut stone is cheap and good, concrete combined curb and gutter seems to be gaining ground. Nothing promotes the use of this material better than a high standard of workmanship, and good forms assist the contractor in doing excellent work as well as in saving money. Century forms are made of well-seasoned pine, two inches thick and bound with quarter-inch iron. This keeps them true and rigid under all conditions. Heavy sheet steel dividing plates cut the material through to the bottom, and these are provided with quick-locking clamps, which make the forms easy to set up and take down. The forms are fifteen feet long, divided into three five-foot sections, thus making it possible to make and lay fifteen feet at a single operation with one set of forms. Regular stock outfits are designed for making 18-inch gutter and 6-inch curb—the ordinary standard size. The exposed edges of curb and gutter made with Century forms are rounded slightly to prevent chipping. A good line of cement workers' tools are made by this company, such as edgers in five shapes; gutter-making tools, two shapes; outside and inside angle tools; two jointers and a radius tool. Among the sidewalk tools are rollers and tampers, but apparently no wooden float, a tool by means of which a rough surface may be given to the surface of a cement walk. "Hercules" concrete mixers are made by this company, adapted, of course, to mixing the comparatively small amounts of concrete required by contractors for curbing and sidewalks.

### Sewer Cleaner

AN efficient device for cleaning sewers is that manufactured by the Healey Sewer Machine and Construction Company, 705 Park Row Building, New York City. It consists of a metal shovel followed by a rolling platform. Ordinarily it is guided by a rope attached to two hooks at the front of the shovel and another rope attached to the rear end of the platform. In special cases, however, where it is necessary to overcome uneven places in the sewer invert, a third rope is attached to the back of the shovel, passes backward through a pulley at the rear of the machine and then forward again. By pulling on this rope the front of the shovel is raised, while a special device prevents the rear end of the platform from rising. To use the machine it is first necessary to pass a rope through the section to be cleaned, by means of a jointed rod or otherwise. The machine is attached to this rope at the down-stream manhole and drawn into the sewer, rear end first, for about 10 feet. It is then pulled out, and the sediment collected and pushed ahead by the shovel is removed. The next time the machine is sent in 10 feet further, and so on until the entire section between manholes is cleared. In cases where a sewer is completely stopped up a machine of a smaller diameter than of the sewer being operated on may be used. The difficulty of cleaning sewers too small to be entered by a man disappears with the use of this machine, according to claims made.

### Multiple Luminous Arc Lamps

THE luminous metallic arc is now recognized as the most efficient contrivance for electric street illumination in commercial use. This system of street lighting, having passed the experimental stage, is now in quite general use. For low voltage, direct-current multiple circuits, however, there has been but little use made of the luminous arc lamp.

The General Electric Co., of Schenectady, N. Y., has now on the market a luminous arc lamp for operation in multiple on direct-current circuits of from 100 to 125 volts. As to the general form of this lamp, the casing is of solid copper, with a black oxidized finish, and of sufficient thickness to form a durable housing for the lamp mechanism, as well as a substantial support for the outer globe and its supporting ring. The main frame consists of a one and one-half-inch iron pipe connecting the top and bottom castings. This method gives a rigid construction, and at the same time provides a suitable center draft or chimney for disposal of the arc fumes. At the top this chimney is protected from rain and snow in such a manner as not to interfere in any way with the natural and uniform draught required for the proper action of the arc.

## THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

### ROADS AND PAVEMENTS

**Highway Construction in Massachusetts.** Paper before Mass. Highway Commission. By Chas. W. Ross. Illustrated. 3 1-2 pp. Good Roads, February.

**Year's Progress in Road Building.** Mileage and expenditures in each of the States of the Union in 1904. Illustrated. 7 1-2 pp. Good Roads Magazine, February.

**Commercial Use of Highways.** Paper before Road Traction Engineers, England. By H. Howard Humphreys. 5 pp. The Surveyor, February 14.

**International Road Congress.** 1-2 p. Contract Journal, January 22.

**Dust Remedy for Macadam Roads.** Specifications for using coal tar, prepared by Road Commissioner MacDonald, of Connecticut. 1-4 p. Good Roads Magazine, February.

**Tar and Oil, Experiments with, on Rhode Island Highways.** Paper before Am. Assn. for Advancement of Science. By A. H. Blanchard. 2 pp. Engineering Record, February 8.

**Oil Macadam.** Discussion before League of California Municipalities by A. G. Campbell and others. 2 pp. Pacific Municipalities, January.

**Petrolithic Pavement.** Discussion before League of California Municipalities. 6 pp. Pacific Municipalities, January.

**Bituminous Road Treatment in Mexico.** Illustrated. 1 1-2 pp. Contract Journal, February 19.

**Asphalt Concrete.** Discussion before League of California Municipalities. By F. J. Boland. 3 1-2 pp. Pacific Municipalities, January.

**Bitulithic Pavement.** Discussion before League of California Municipalities. By S. J. Van Ornum. 3 1-2 pp. Pacific Municipalities, January.

**Asphalt Pavements, a defense of.** Comparison with block pavements and patented pavements. By Clifford Richardson. 1 2-3 pp. Engineering Record, February 15.

**Asphalt Pavements, Detailed Cost of a Season's Work in Laying.** By F. E. Puffer. 1 1-4 pp. Engineering Contracting, February 5.

**Municipal Asphalt Repair Plant at New Orleans.** Cost and data concerning operation. Illustrated. 2 3-4 pp. Engineering Contracting, February 5.

**Wood Paving Block, Requirements for Treating.** Abstract of paper before Am. Soc. of Municipal Improvements. By Geo. W. Tillson. 3-4 p. Southern Building Record, February.

**Hassam Pavement and Vitriified Brick in Los Angeles.** Discussion by J. R. Johnson, before League of California Municipalities. 3 1-2 pp. Pacific Municipalities, January.

**Paving Brick Bids.** At Detroit, Mich. 1-4 p. Municipal Journal and Engineer, February 12.

**Sidewalks, Cement.** Specifications of the National Cement Users Assn. 1 p. Engineering Contracting, February 5. 1 1-4 pp. Concrete, February.

**Guarantees of Pavements Illegal.** Compilation of decisions in various States. By I. W. Howard. 2 2-3 pp. Municipal Engineering, February.

**Street Grades.** Discussion before League of California Municipalities. 3 1-2 pp. Pacific Municipalities, January.

**Worcester, Mass., Paving and Street Lighting at.** Some figures recently obtained. 3-4 p. Municipal Journal and Engineer, February 26.

### SEWERAGE AND SANITATION

**Sewerage and Sewage Disposal at Ithaca, N. Y.** Sewerage system and septic tanks. Illustrated. 4 pp. Municipal Journal and Engineer, February 5.

**Baltimore Sewerage Works.** A description of progress in their construction. Illustrated. 2 pp. Engineering Record, February 8.

**The Sewerage of Cities.** Paper before National Congress of Public Works of France. By Eugene Chardon. 11 pp. Technique Sanitaire, February.

**Chicago Drainage Canal, The Future of.** Review of history and editorial discussion of its future. Illustrated. 2 1-3 pp. Engineering News, February 13.

**River Pollution.** Discussion before the Royal Sanitary Institute. 2 pp. The Surveyor, February 14.

**Run-off from sewer areas.** Description of apparatus and methods employed in studying this by committee of Boston Society of Civil Engineers. 1-2 p. Engineering Record, February 115.

**Overflowing Sewers, Fraudulent Claims for Damages from, in Brooklyn, N. Y.** 1-2 p. Engineering News, February 6.

**Sewage Pumping Station.** The Lawrence Ave. Station, Chicago. Extended description. Illustrated. 6 pp. The Engineer, February 15.

**Pneumatic Ejectors for Lifting Sewage.** The Coombs Ejector. Illustrated. 2 pp. The Surveyor, January 31.

**Sewer, Intercepting, in Salt Lake City.** Description of 40-inch reinforced concrete sewer. 1 p. Illustrated. Engineering Record, February 22.

**Los Angeles, Cal., Outfall Sewer.** Description of this 12-mile sewer recently completed. Illustrated. 3 pp. Engineering Record, January 25.

**Concrete Sewers, Forms of.** Description of Duralite forms for this and other kinds of concrete work. Illustrated. 3-4 p. Engineering Record, January 25.

**Reinforced Concrete Pipe.** A traveling mold for making. Abstract from paper before Am. Soc. C. E. By C. W. Smith. Illustrated. 2 pp. Engineering News, February 20.

**Cast Iron Pressure Sewer in a Railroad Yard.** Construction at Tompkinsville, Staten Island. Illustrated. 3-4 p. Engineering Record, February 15.

**Excavating Sewer Trench with Potter Trench Machine.** Method and cost. 1 p. Engineering Contracting, January 29.

**Sewer Contracts, Risks of.** Discussion of both physical and legal risks. 1-2 p. Engineering Record, February 1.

**New Orleans Sewerage Lawsuit.** Discussion of the evidence. By Alexander Potter. 2 3-4 pp. Municipal Engineering, February.

**Sewage Purification Plant of Wilmsdorf.** 3-4 p. Gesundheits Ingenieur, February 15.

**Sewage disposal at the Montefiore Sanitarium.** Septic tank and sprinkling filters of 30,000 gallons daily capacity. Il-

lustrated. 1 1-2 pp. Engineering Record, February 15.

**Sewage Disposal Problem with special reference to South end of England.** By E. J. Elford. 1-2 p. Local Government Journal, January 25, February 1 and February 8.

**Sewage Disposal Plant at Ridgewood.** Septic tank and contact filters. Brief note. 1-4 p. Municipal Journal and Engineer, February 19.

**Sewage Disposal at Fairmount, Minn.** Description of septic tank and sand filters. By A. Marston. Illustrated. 1 3-4 pp. Engineering Record, February 1.

**Bishops Hull Sewage Disposal Works, Septic Tank and Sprinkling Filter.** Illustrated. 1 1-2 pp. Contract Journal, February 19.

**Septic Tank at Ithaca, N. Y.** Description of plant recently completed. Illustrated. 1 1-3 pp. Engineering Record, February 1.

**Sewage Disposal by Slate Contact Beds.** By W. J. Diddin. 1-3 p. Local Government Journal, January 25.

**Sewage Disposal in Germany.** Abstract of report of. C. F. Wike. 1-2 p. Municipal Journal and Engineer, February 26.

**Condensing Purposes, Sewage for.** Used for this purpose by Edinborough Electric light Station. Illustrated. 3-4 p. Contract Journal, Jan. 29.

**Sewage Sludge, Separation and Value of.** 7 1-2 pp. Gesundheits Ingenieur, January 25.

**Septic Tank Patents.** Decision of U. S. Circuit Court of Appeals on the Cameron Patent. 3 1-4 pp. Engineering Record, January 25.

**Bacterial Analyses.** The significance of bacterial counts. Abstract of report. By Stephen DeM. Gage, of Mass. Board of Health. 1-2 p. Engineering Record, February 1.

**Bacterial Analyses and Temperature.** Effect of the latter on selective growth of bacteria in culture media. Synopsis of report of Stephen deM. Gage. 1 1-4 pp. Municipal Journal and Engineer, February 5.

**Health Board of Augusta, Ga.** Work of Board and health ordinance. 1 1-3 pp. Municipal Journal and Engineer, February 5.

**Public Health Acts of 1907 in England.** 2 1-4 pp. The Surveyor, January 24.

**Municipal Hygiene.** By Ricardo Miyares. 3-4 p. Revista Municipal, February 1.

**Rural Sanitation.** Editorial discussion. 1-3 p. Contract Journal, Feb. 12.

**Tuberculosis.** International Congress of. Letter of U. S. Surgeon General to Health Officers. 1-2 p. Public Health Reports, February 7.

**Pure Milk Supply, How to Secure.** By Gerald McCarthy. Bulletin of North Carolina Board of Health, January.

**Meat Inspection.** Special reference to English Conditions. By Jas. A. Dixon. 10 pp. Journal Royal Institute of Public Health, February.

**Ovster Fattening.** Danger in. Brief note. Connecticut State Board of Health Bulletin, January.

**Rats, The War Against.** Advice to sanitary authorities. 1-2 p. Local Government Journal, January 25.



## WATER SUPPLY

**Water Supply** of New York State. Abstract of report of Commission. 1-2 p. Engineering News, February 13.

**Croton Drainage Area**, Amount of Water Supply Available from. Technical discussion. By Alfred D. Flynn. 2 pp. Engineering News, February 6.

**Selection and Storage of Water** for Villages and Farm Houses. By Harold G. Turner. 2 pp. Contract Journal, February 19.

**Water Power Values** and Damages Caused by Diversion. Abstract of Papers by Chas. T. Main, Clemens Herschel and others, before New England Water Works Assn. 1-2-3 pp. Engineering-Contracting, January 29.

**Water Works System** of Waycross, Ga. Illustrated. 3-4 p. Fire and Water, February 5.

**Detroit Water Works Notes**. Meters, repairs, etc. 3-4 p. Municipal Journal and Engineer, February 19.

**Water Supply for Goldfield**. 1-2 p. Engineering and Mining Journal, Feb. 8.

**Water Works of Portland, Ore.** Reservoirs, Pipe lines, etc. Illustrated. 4 pp. Engineering News, February 6.

**Aqueduct, Catskill**. Bench level operations along the line. Description of standard bench marks. Illustrated. 1-2-3 pp. Engineering News, February 20.

**Los Angeles Aqueduct**. Description of the preliminary work in 1907. Illustrated. 3-2-3 pp. Engineering Record, February 8.

**Dams, Masonry**. The Stability of. Editorial discussion. 1-1-2 pp. Water, February 15.

**Stresses in Dams**. Experimental investigations of masonry dams. Paper before Institution of Civil Engineers, by John Wottley. 2 pp. Water, Feb. 15.

**Earth Dams**. Reinforced Concrete diaphragms for. By B. M. Hall. Illustrated. 1-2 p. Engineering News, February 6.

**Ashokan Reservoir**. Estimate of cost and data of cost of similar embankments. Discussion of testimony given in investigation. 7-3-4 pp. Engineering-Contracting, February 12 and February 19.

**Ashokan Dams**. Cost of. History of case and statement of methods employed by Chief Engineer in making estimate. 4 pp. Engineering Record, February 15.

**Wrought Iron Pipe**. Corrosion of. Effect of coal gas on. Experiments by Wm. Dudley. 1 p. American Gas Light Journal, February 10.

**Corrosion of Wrought Iron and Soft Steel Pipes**. Paper before American Society of Heating and Ventilating Engineers. By T. N. Tomson. Illustrated. 3 pp. Iron Age, February 6.

**Tuberculation** and flow of water in pipes. Abstract of paper, before Am. Water Works Assn. By N. S. Hill. 3-4 p. Engineering Record, January 25.

**Repairing** a submerged water main. Novel repairs to a 16-inch main under the Mississippi at St. Paul. 3-4 p. Illustrated. Engineering Record, February 1.

**Freezing** of Wells and Pumps. Brief discussion of same. 1-4 p. Engineering Record, February 1.

**Pumping Plant**, Centrifugal, at New Albany, Ind. Brief description of water works plant. 1-4 p. Engineering Record, February 1.

**Experience with a Pumping Plant** at Taunton, Mass. By George F. Chase. Illustrated. 3-4 p. Fire and Water, February 19.

**Water Purification in Ohio**. Abstract of preliminary report of State Board of Health on plants in operation and under

construction. 3 pp. Engineering Record, February 22.

**Water Filtration Plant** at Washington, Use of Concrete in. Illustrated. 2 pp. Concrete, February.

**Cincinnati Water Purification Plant**. Description of settling reservoirs, rapid filters, etc. Illustrated. 1 p. Engineering Record, February 1.

**Mechanical Filter Plant**, the Development of the. Paper before Ohio Engineering Society. By Philip Burgess. 2-3-4 pp. Engineering Record, February 22.

**Chemical Precipitation** of water at St. Louis. Description of method employing lime and iron. Illustrated. 2 pp. Engineering News, February 20.

**Water Analysis**. Notes concerning nitrates, etc. 1 p. Water, February 15.

**Hydrant Rentals**. Amounts paid by various cities in the U. S. 2-3-4 pp. Water and Gas Review, February.

## STREET LIGHTING AND ELECTRIC POWER

**Street Lighting in London**. Some notes on. By H. Thurston Owens. Illustrated. 1-1-4 pp. Electrical Review, February 15.

**Street Lighting in New York City**. Lamp posts and Lamps. By H. Thurston Owens. Illustrated. 2 pp. Progressive Age, February 1.

**Municipal Lighting in Canada**. Some Statistics. 1-3 p. Municipal Herald, February.

**Electric Lighting in Auckland**. Municipal plant. 1-2 p. Consular and Trade Report, February 17.

**South Norwalk Lighting Plant**. Description of equipment. Illustrated. 2 pp. Power, February 25.

**Municipal Lighting in St. Louis**. History of project and results achieved. By Charles Claude Casey. Illustrated. 3 pp. Municipal Journal and Engineer, February 19.

**Power Plant** of Pennsburg, Pa., Municipal Electric Plant. Illustrated. 2 pp. The Engineer, February 15.

**Chicago Drainage Canal**, Hydro-electric Development on the. General description of plant. Illustrated. 5-1-3 pp. Electrical Review, February 8.

**Electrical Supply of Paris**. Plans for bringing supply 300 miles from the river Rhone. 1-2 p. Electrical Review, February 15.

**Gas Power Plant**. Municipal plant at Ottawa, Kan. Illustrated. 1 p. Power, February 25.

**Gas Lamps**, Hempstead Prefers, to Electric Lamps. By H. Thurston Owens. 1-1-4 pp. American Gas Light Journal, February 3.

**Testing Gas Meters**. Method employed by New York Public Service Commission. 1-1-4 pp. Municipal Journal and Engineer, February 15.

**Photometry Standards**. Discussion of report of American Gas Institute's Committee. 3-4 p. Progressive Age, February 15.

**Photometer**, A New Universal. Description and method of operating. By Clayton H. Sharp and Preston S. Millar. Illustrated. 2-1-2 pp. Progressive Age, February 1.

**Lamps, Bracket**, for Street Lighting in Boston. 1-4 p. Municipal Journal and Engineer, February 5.

**Flaming Arc Lamp**, The American. Illustrated description. 1-1-2 pp. Electrical Review, February 22.

**Eighty Cent Gas in Boston Made Possible** by the Sliding Scale. By Wm. D.

Marks. 1-2 p. Municipal Journal and Engineer, January 15.

**Gas Meters**, Reliability of. By R. A. Field. 1-2 p. Water and Gas Review, January.

**Electrolysis**. Paper before Am. Gas Institute. By Albert F. Ganz. Illustrated. 6-1-2 pp. Progressive Age, February 1.

**Lighting Contracts**, Basis of. Argument for amount of gas or current rather than candle power as basis. By Alton D. Adams. 1-1-2 pp. Municipal Journal and Engineer, February 5.

**Sliding Scale** for Gas, English. Its use in Boston. By Wm. D. Marks. 1 p. Municipal Journal and Engineer, February 5.

**London Gas Prices**. Reduction in prices reported by Consul-General Robt. J. Wynne. 1-2 p. Consular and Trade Reports, February 14.

**Price of Gas in St. Paul**. From "Public Service." By R. S. Feurtado. 4-3-4 pp. Progressive Age, February 1.

## FIRE AND POLICE

**Fire Department**, Boston, Investigations. Report of Finance Commission. 2 pp. Firemen's Herald, February 1.

**Fires**, Million Dollar, in Small Cities. Description of the Portland, Me., fire. Illustrated. 5 pp. Insurance Engineering, February.

**Fire Alarm Systems**, Automatic. Description of the May Oatway system. Illustrated. 3-4 p. Engineering News, February 6.

**High Pressure Fire System** for Oakland, Cal. Outline of proposed plan. 1-2 p. Municipal Journal and Engineer, February 5.

**Fire Hose**, Test of. Report of Board of Fire Underwriters on New York City's hose. Illus. 8 pp. Insurance Engineering, January.

**Police Department**, The Head of the Single non-professional head advocated. By Leonhard Felix Fuld. 2-1-2 pp. Municipal Journal and Engineer, February 5.

**Politics**, Police and. Plea for divorcing them. 3-4 p. Municipal Journal and Engineer, February 5.

**Detection**. The Business of. The methods employed by criminal hunters. Illustrated. By Arthur H. Gleason. 2 pp. Collier's, February 8.

**Tramps**. How Poughkeepsie Deals with. Recommendations of National Vagrancy Committee. 1-1-2 pp. Review of Reviews, February.

## GOVERNMENT AND FINANCE

**Commission Government** at Washington, D. C. Description of this form of government. By Henry B. F. Macfarland. 2-1-4 pp. Canadian Municipal Journal, February.

**Town Meeting Government** at Brookline, Mass. By Arthur W. Spencer. 10 pp. Government Magazine, June.

**Municipal Election Law** in Iowa. Interpretation by the City Attorney of Des Moines. 3 pp. Midland Municipalities, January.

**Law of Officers**, Determination of the official relation. By Leonhard Felix Fuld. 2 pp. Law Students' Helper, January.

**Public Service Commission** of New York State. Synopsis of Annual Report. 1-2 p. Progressive Age, February 15.

**Greater Birmingham**. Proposed merger for Birmingham, Ala., outlined. 1-2 p. Municipal Journal and Engineer, February 5.



**Bond Sales and Cost of Public Work.** Argument for starting municipal work now. 1-4 p. Municipal Journal and Engineer, February 26.

**Municipal Bond Sales for December.** Tabulated statement, giving details. 3-4 p. Municipal Journal and Engineer, February 5.

**New York City Bond Issue.** Editorial discussion of. 3-4 p. The Financier, February 24.

**Special Assessments.** Paper before League of Iowa Municipalities. By M. J. Mitchell, with discussion. 9 1-2 pp. Midland Municipalities, January.

**Finances of Liverpool, England.** Report of Council Committee. 1 p. Contract Journal, January 22.

**Business Methods for Cities.** Work of the Bureau of Municipal Research. By Wm. H. Allen. Illustrated. 5 1-2 pp. Review of Reviews, February.

**City Book-keeping.** Educating the Public in. The Bureau of Municipal Research. By Wm. H. Allen. 2-3 p. Leslie's Weekly, February 20.

**Uniform Public Accounting in Ohio.** Address before National Ass'n of Comptrollers and Accounting Officers. By Joseph T. Tracy. 1 1-4 pp. Municipal Journal and Engineer, Feb. 5. 1 1-2 pp. Municipal Engineering, February.

**Depreciation of Public Utility Properties.** Paper before Northwestern Electrical Ass'n. By C. N. Duffy. 1 1-4 pp. Street Railway Journal, February 1.

## REFUSE COLLECTION AND DISPOSAL

**Street Cleaning and Waste Disposal in New York.** Abstract of report of Special Commission on New York City conditions; with recommendations. 2 pp. Engineering Record, February 22.

**Snow, Handling Sidewalk.** Methods used in Washington. 1-4 p. Municipal Journal and Engineer, February 5.

**Garbage Disposal at New Bedford, Mass.** Description of plant and process of New Bedford Extractor Co. Illustrated. 2 1-4 pp. Municipal Journal and Engineer, February 26.

**Garbage Disposal in Milwaukee.** Discussion of report with synopsis of same. 1 1-3 pp. Engineering Record, January 25.

**Refuse Disposal at Milwaukee, Report on.** Synopsis of Rudolph Hering's report. 1 1-2 pp. Municipal Journal and Engineer, February 12.

**Refuse Destructors, Progress in Designing.** 1 p. The Surveyor, February 7.

**Refuse Destructor Furnishing Electric Power.** Description of works at Greenock, England. Illustrated. 2 1-2 pp. The Surveyor, February 14.

**Analyzing City Garbage.** Method employed at Milwaukee. 1-2 p. Municipal Journal and Engineer, February 26.

## PARKS AND CITY BEAUTY

**Shade Trees, Care of.** Work done in East Orange, N. J., by Shade Tree Commission. Illustrated. 3 pp. Municipal Engineering, February.

**Washington's Shade Trees.** From annual report of Supt. of Parking for 1907. 1-2 p. Municipal Journal and Engineer, February 5.

**Replanning of Cities.** A symposium on City Planning. Includes the following: Introduction by Charles M. Robinson. 2 pp.

### The Theory of Planning.

**Traffic and the City Plan.** By Geo. E. Hooker. 2 1-2 pp.

**The Street the Basic Factor in**

**the City Plan.** By Andrew Wright Crawford. Illustrated. 8 1-2 pp.

**The Civic Center—A Dominant Esthetic Feature.** By Sylvester Baxter. 2 pp.

**The Neighborhood Center—A Moral and Educational Factor.** By Dwight F. Davis. Illustrated. 2 1-2 pp.

**The Park in Its Relation to Physical Geography and the City Plan.** By Henry A. Barker. Illustrated. 5 1-2 pp.

**Suburban Areas Should be Controlled. A Hint from Germany.** By Howard Woodhead. 1 1-2 pp.

**City Planning in Justice to the Working Population.** By Benjamin C. Marsh. 5 pp.

**Town Planning.** By Edward T. Hartman. Illustrated. 3 pp.

### The Practice of Planning.

**The Growth of City Planning in America.** By J. Horace McFarland. 7 pp.

**The Practice of Replanning.** Suggestions from Boston. By Arthur A. Shurtleff. Illustrated. 4 pp.

**New York City Improvement Report.** By Frederick S. Lamb. Illustrated. 4 pp.

**Recent City Planning in Philadelphia.** Andrew Wright Crawford. Illustrated. 5 1-2 pp.

**The City Plan Report of St. Louis.** By C. M. R. Illustrated. 3 pp.

**Resetting Minnesota's Capital.** By Webster Wheelock. Illustrated. 2 1-2 pp.

**Cleveland Group Plan.** By Frederic C. Howe. 1 p.

**Recent Developments in Springfield, Mass.** Hiller C. Wellman. 1 p.

**Practical Side of City Planning.** By Robert W. de Forest. 1 p.

**The New Chicago.** By Graham Romney Taylor. Illustrated. 6 1-2 pp.

**City Plan Notes.** Illustrated. 5 pp. Charities and The Commons, February 1.

## TRAFFIC AND TRANSPORTATION

**Street Congestion in Boston.** Conditions and recommendations. 1 p. Team Owners Review, February.

**Interurban Railways.** Address before National Business League of America. By Hugh McGowan. 3 pp. Municipal Engineering, February.

**Electrification of Suburban Zone of New York Central Railroad.** Paper before Am. Soc. C. E. By Wm. J. Wilgus. Illustrated. 3 1 pp. Society Proceedings, February.

**Tunnels, Hudson River, General Description of.** Illustrated. 3 pp. Electrical Review, February 29.

**Ventilation of the Washington terminal tunnel.** Description of fan ventilation. Illustrated. 2-3 p. Engineering Record, February 1.

**Grade Crossings, Elimination of.** History of campaign at Wilkes-Barre. 3 pp. Board of Trade Journal, January.

**Accidents from Street Cars, A Campaign Against, in Omaha.** 1-2 p. Street Railway Journal, February 8.

**Subway, Proposed Track Changes in New York Rapid Transit, at Ninety-sixth street station.** 1 p. Engineering Record, February 29.

## MISCELLANEOUS

**Municipal Engineering in 1907.** Review of work done. 27 pp. The Surveyor, January 31.

**Bridges, Highway.** Recent examples of reinforced concrete in Great Britain.

Illustrated. 4 1-2 pp. The Surveyor, February 7.

**Walnut Lane Bridge, Fairmount Park, Philadelphia.** Construction, methods employed on longest concrete arch in the world. Illustrated. 2 1-2 pp. Engineering Record, February 15.

**Retaining Walls.** Theoretical discussion. Paper before English Civil and Mechanical Engineers Society. By A. T. Walmisley. Illustrated. 6 3-4 pp. Water, February 15.

**Concrete Surfaces, The Treatment of.** Paper before National Association of Cement Users. By E. B. Green. 1 1-4 pp. Engineering Record, February 22.

**French Excavating Machine.** Description of a new wheel excavator. Illustrated. 2-3 p. Engineering News, February 13.

**Digging a 36-mile trench with a Buckeye Traction Ditcher.** Method and cost in detail. Illustrated. 3-4 p. Engineering-Contracting, February 12.

**Notes and Records, Filing Engineering.** Description of the system developed in the office of the City Engineer of Salt Lake. Illustrated. 2 1-2 pp. Engineering Record, February 8.

**Contract Work, City Bidding on.** Methods and results of this in Toronto. 1 p. Municipal Journal and Engineer, February 12.

**Contract Extras, Payments for.** Editorial discussion. 2-3 p. Engineering Record, February 15.

**Approximate Estimates.** Legal and Moral Principles Involved. Paper before Ohio Engineering Society. By Alex. Potter. 1 1-4 pp. Engineering Record, February 22. 1 p. Fire and Water, February 19.

**Literature of Municipal Engineering.** Books of 1907 Reviewed. 1 1-2 pp. The Surveyor, January 31.

**Lake Front Harbor Situation at Chicago.** 1 3-4 pp. Real Estate News, February.

**Baths and Comfort Stations, Brooklyn.** Brief description. 1-2 p. Municipal Journal and Engineer, February 12.

**Public Baths, General Article.** By C. J. Fox. Illustrated. 2 1-2 pp. Municipal Engineering, February.

**Bath, New York City's New Public.** Description of building. Illustrated. 2 1-4 pp. Municipal Journal and Engineer, February 12.

**Convenience Station at Lawrence, Mass.** Description. Illustrated. 2 pp. Municipal Journal and Engineer, February 5.

**Smokeless Combustion.** Discussion of paper by Prof. Breckenridge. 1-2 p. Engineering Record, February 8.

**Telephone Construction, Aerial and Underground.** Paper before International Independent Telephone Convention. By C. H. Judson. 2 1-2 pp. Telephony, February.

**Bascule Bridge between Portsmouth and Taunton, R. I.** Illustrated description of new structure. 3 pp. Engineering Record, February 29.

**Reinforced Concrete Piers for Baltimore.** Description of proposed work. 1 col. Engineering Record, February 29.

**Tunnels in New York.** Illustration of new tubes under Hudson River, with Editorial Comment. 2 pp. Engineering Record, February 29.

**Resurveys for Small Towns, Need of, to Avoid Trouble in Future Years.** 1 col. Engineering Record, February 29.

## NEWS OF THE SOCIETIES

**Medical Society of the District of Columbia.**—At a meeting February 19 in the lecture hall of George Washington University typhoid fever was the topic for discussion. Henry D. Fry, President of the Society, presented Dr. Magruder, who read a paper on typhoid fever in the District during the past thirteen years. He explained the improvements that have been made in the water supply and stated that now clear, absolutely pure, safe water is furnished direct from the taps, the greater portion of the year. Maj. Spencer Cosby, Corps of Engineers, U. S. A., in charge of the Washington Aqueduct and filtration plant, read a paper on the "Water Supply of Washington." He recommended the introduction of the coagulation method of treating water at the Georgetown reservoir. Dr. Wiley read a paper on the "Dangers of Domestic Filters, of Water Coolers and Ice Cream." These, he said, were the cause of most of the typhoid that existed in the District. Dr. M. J. Rosenau, Director of the Hygiene Laboratory, Public Health and Marine Hospital Service, speaking of the "Causes of Typhoid Fever," said they were three in number, milk, contact and importation. Prof. C. B. Lane, Chief of the Bureau of Dairy Products, U. S. Department of Agriculture, read a paper on the prominent part played by the common house fly in typhoid fever. Others who read papers were F. F. Longley, Chief Chemist and Assistant Superintendent of the Filtration Plant, on "The Washington Filters and the Quality of the Effluent Therefrom"; Dr. R. Meade Bolton, on "The Water Supply of Dairy Farms," and J. H. Kastle, Chief Division of Chemistry, Public Health and Marine Hospital Service, on "New Remedies to Destroy Typhoid Bacilli in the Gall Bladder." More than four hundred members of the society and their friends attended the meeting.

**Municipal Engineers of the City of New York.**—At the regular meeting of the Society, February 26, at the Engineering Societies Building, 29 West Thirty-ninth street, a paper was read by W. B. Fuller on "The Proposed Filtration of the Croton Water Supply of New York City."

**Engineers Club of Baltimore.**—At the next regular meeting of the club, March 7, a paper will be read by Swepson Earle, Engineer of the Maryland Shellfish Commission, on the "Maryland Oyster Survey and Oyster Farming in the Chesapeake Bay."

**Appalachian Engineering Association.**—The following officers have been elected for the coming year: A. Wagner, President; Ray V. Hennen, Vice-President; R. H. Buchanan, Treasurer; Dr. Henry M. Payne, Secretary, Morgantown, W. Va.

**New England Water Works Association.**—The program of the regular meeting to be held March 11 is as follows:

10.00 o'clock.—The headquarters in Tremont Temple will be open for the use of members.

11.30 o'clock.—Meeting of the Executive Committee at the Headquarters, Tremont Temple.

1.00 o'clock.—Lunch will be served at Hotel Brunswick, Copley Square. Tickets, \$1.50 to be had at Headquarters during the morning and later at the Hotel.

2.00 o'clock.—The following papers will be presented:

"The Typhoid Fever Epidemic at Wattertown, N. Y., in 1904," illustrated, by George A. Soper, Ph.D., Consulting Sanitary Engineer, 29 Broadway, New York.

"Troy Water Works Extension," by E. L. Grimes, Chief Engineer Bureau of Water Supply, Troy, N. Y.  
Topical Discussion.

**Municipal Art Society of New York.**—The seventh annual exhibition will be held in the galleries of the National Arts Club, 119 East Nineteenth street, March 4 to 27, inclusive. The annual dinner of the Society took place on Tuesday, March 3. The scope of the exhibition will include, Proposed or Completed Schemes in Decorative Painting and Sculpture; Landscape Gardening; Drawings or Photographs of Municipal Architecture of a Decorative or Monumental Character; Civic Centers, and Improvements in American and European Cities; Fountains; Stained Glass; Mosaics; Models of Work Executed in Stone, Wood, Bronze or Wrought Iron; Street Fixtures; Bridges; Maps of Proposed Parkways; Park Fixtures; Window Boxes; and similar objects which illustrate phases of municipal improvement. Works particularly bearing upon New York will be desired, but Municipal Art of any section will be the purpose of the exhibition. The object of the exhibition is to show not only works of art which are applicable to municipal use, but also to indicate the advance in municipal art during the past year as shown in work which has been executed.

**American Institute of Electrical Engineers.**—Special meeting to be held, March 5, at 8:15 p. m., at the Engineers Building, 33 West Thirty-ninth street, open to the public, under the auspices of the Institute, will be devoted to the consideration of the subject of "Conservation of Natural Resources." Mr. Gifford Pinchot, Forester of the United States Department of Agriculture, will give a lecture illustrated by lantern slides.

## Calendar of Meetings

March 4.

**American Society of Civil Engineers.**—Regular meeting at the House of the Society, 220 West Fifty-seventh street, New York City.—Charles Warren Hunt, Secretary.

March 4-27.

**Municipal Art Society of New York.**—Seventh annual exhibition. Galleries of the National Arts Club, 119 East Nineteenth street, New York City.—Secretary, 119 East Nineteenth street.

March 5.

**American Institute of Electrical Engineers.**—Meeting, Engineers Building, 33 West Thirty-ninth street, New York. Subject of meeting, which is open to public, "Conservation of Natural Resources."—Ralph W. Pope, Secretary, 33 West Thirty-ninth street.

March 9-22.

**Charity Organization Society.**—Exhibit of Congestion of Population. American Museum of Natural History, New York City.—Edward T. Devine, General Secretary, 105 East Twenty-second street, New York City.

March 11.

**New England Water Works.**—Regular March meeting, Hotel Brunswick, Copley Square, Boston, Mass.—Willard Kent, Secretary, 715 Tremont Temple, Boston, Mass.

May 11-16.

**American Water Works Association.**—Twenty-eighth annual convention, Washington, D. C.—J. M. Diven, Secretary, 14 George street, Charleston, S. C.

June 23-26.

**American Society of Civil Engineers.**—Annual convention, Denver, Col.—Charles Warren Hunt, Secretary, 220 West Fifty-seventh street, New York City.

June 23-26.

**American Society of Mechanical Engineers.**—Annual convention, Detroit, Mich.—C. W. Rice, Secretary, 29 West 39th street, New York City.

June 23-27.

**American Society for Testing Materials.**—Annual meeting, Hotel Traymore, Atlantic City, N. J.—Theodore Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.

September 21-October 12.

**National Association for the Study and Prevention of Tuberculosis.**—International Congress, Washington, D. C.—Dr. Henry Barton Jacobs, Secretary, Baltimore, Md.—Dr. Joseph Walsh, Philadelphia, Pa. Special Secretary of the Committee on the International Congress.

## PERSONALS

**ACKERMAN, J. WALTER,** City Engineer of Auburn, N. Y., for the past six years, has opened an office in that city to engage in consulting engineering practice in general municipal work.

**BELT, WILLIAM T.,** Chief Engineer of the Fire Department of the District of Columbia, who has been in the service for forty-five years, raising from private to Chief, has been honored by the passage of a bill by Congress, which provides that he shall, when retired, receive one-half the salary received at the date of retirement; under existing law he would receive but \$100 per month, while the salary now is \$3,500, which would make his retired pay \$1,750 per annum.

**GOLDBAUM, JOE,** and Harry Hachin, Cape Girardeau, Mo., have been appointed by Mayor Patton as City Clerk and City Treasurer respectively, to succeed George Chappell and Gus Schulz, who have been suspended as a result of an investigation of the city's books.

**HARRISON, CAPT. CHRISTOPHER,** City Engineer of Everett, Mass., has been reappointed.

**KASTENKUEHR, EDWARD G.,** Assistant City Engineer of Lexington, Ky., who was employed two years ago to aid in the construction of the new sewer system, has resigned, the work being almost completed, and there being not enough work now to require an assistant to City Engineer P. P. O'Neil.

**KOCH, EDWARD V.,** Building Inspector of Milwaukee, Wis., who served as holdover during the past few months, was reappointed by Mayor Becker and confirmed by Council by a vote of 40 to 2.

**LATROBE, GEN. F. C.,** member of the Park Board, Baltimore, Md., has been nominated and confirmed as President of the Board and George Weems Williams as member of the Board.

**LAYMAN, E. F.,** formerly Sewerage Engineer of Cincinnati, O., has opened an office in the Blymer Building, Cincinnati, where he will engage in general practice as civil engineer, special attention being paid to sewerage, water supply, municipal improvements, examinations, estimates and reports.

**LIPSCOMB, T. W.,** Rome, Ga., elected Mayor of the city, is the youngest man ever elected to the office, being but thirty years of age; he is a native of Virginia and is a member of the law firm of Lipscomb & Willingham; he succeeded Mayor John W. Maddox and will have supervision of water and sewer extension and paving work, for which \$150,000 bonds were voted, and which has just been commenced.

**MAETZEL, HENRY,** and Harry Holton, Chief City Engineer and First Assistant City Engineer, respectively, of Columbus, O., have been reappointed.

**MAXWELL, JAMES R.,** former Alderman of New Haven, Conn., has been elected President of the Board of Police Commissioners of the city.

**PATTESON, M. D.,** City Engineer of Northampton, Mass., has been re-elected.

**RALSTON, J. C.,** has succeeded Mr. Charles McIntyre as City Engineer of Spokane, Wash.

**RAPELJE, A. C.,** of Poughkeepsie, N. Y., has been appointed County Engineer of Dutchess County, New York, succeeding Mr. C. A. Fowler, resigned.

**SLOCUM, CHARLES M.,** City Engineer of Springfield, Mass., has been re-elected.

**STEINMANN, H. E.,** was recently appointed City Engineer of St. Charles, Mo.



## THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

## BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>Street Improvements</b>				
New York	New York	March 4, 2 P.M.	Excavating and removing rock in hydrant trenches.	John H. O'Brien, Com'r W.S., G. & E.
New York	New York	March 5, 11 A.M.	Asphalt paving on concrete, grading, curbing, etc.	Louis F. Hatten, Pres. Boro. Bronx.
New York	Corning	March 5, noon	Brick paving, 16,250 sq. yds.; macadam, 4,250 sq. yds., both jobs with cement curbs and gutters.	J. T. Hall, Clk., Bd. Pub. Works. Knox County Commissioners.
Indiana	Vincennes	March 5, 2 P.M.	Constructing 2 miles and 3,334 ft. gravel road in Johnson twp.	John J. Mannion, City Clerk.
New Jersey	Gloucester	March 5, 8 P.M.	Constructing macadam on 11 streets; furn. and laying curb, gutters and paving, 11 sts.; grading and filling 6 sts.	John J. Mannion, City Clerk.
Dist. of Col'bia	Washington	March 5	Resurfacing roadways on Antietam battlefield.	John J. Mannion, City Clerk.
Kentucky	Louisville	March 6	Vit. block paving, grading, curb 4 sts.; several alleys.	John J. Mannion, City Clerk.
Ohio	Toledo	March 6	Furn. material and laying all delin. cement and stone walks, etc., in 1908.	John J. Mannion, City Clerk.
Wisconsin	Racine	March 7, 10 A.M.	Paving N. W. Ave., inc. 5,412 sq. yds. brick pavement; 1,161 lin. ft. concrete gutter; 1,118 ft. comb. curb and gutter; 947 cu. yds. exc.	John J. Mannion, City Clerk.
Ohio	Sandusky	March 9, 10 A.M.	Widening roadway at approaches over Monroe St. arch bridge.	John J. Mannion, City Clerk.
Ohio	Delaware	March 9, noon	Brick, paving, grading, etc., E. Winter, N. Lake, E. Central Aves.	John J. Mannion, City Clerk.
Pennsylvania	Oil City	March 9, 4 P.M.	Grading, curbing and paving 6 sts.; 10,090 cu. yds. excavation; 7,610 ft. curb; 12,130 yds. brick paving; 700 cu. yds. concrete retaining wall; 500 ft. 12-10-in. sewers, 25 sewer inlets.	John J. Mannion, City Clerk.
Missouri	St. Charles	March 9, 8 P.M.	Paving 7 blocks, vit. brick; granitoid curb, etc., 2d St.; cost, \$26,000.	John J. Mannion, City Clerk.
New Jersey	Asbury Park	March 9	Constructing 25,000 sq. yds. of paving.	John J. Mannion, City Clerk.
Indiana	Columbus City	March 9	Paving various streets, inc. 35,000 sq. yds. brick.	John J. Mannion, City Clerk.
Ohio	Berea	March 9	Brick or block paving, curbing, grading certain sts.	John J. Mannion, City Clerk.
Tennessee	Chattanooga	March 10, 2:30 P.M.	Asphalt resurfacing, 10,344 sq. yds., 3 sts.; 807 sq. yds. brick gutters.	John J. Mannion, City Clerk.
New Jersey	Trenton	March 10, 2:30 P.M.	Improving 1 street and 5 roads.	John J. Mannion, City Clerk.
Oklahoma	Hobart	March 10, 8 P.M.	Grading, curbing, paving, inc. 41,700 sq. yds. brick, bitulithic or asphalt, 8,000 ft. stone or concrete curb, 4,000 ft. headers.	John J. Mannion, City Clerk.
Minnesota	Crookston	March 10, 8 P.M.	Cement walks (tile and concrete), street crossings and intersections.	John J. Mannion, City Clerk.
Iowa	Clinton	March 10, 8:30 P.M.	Vit. brick paving on 5-in. Portland cement; comb. curb and gutter on 4th Ave. 21 to 3d St.	John J. Mannion, City Clerk.
Ohio	Newark	March 10	Brick paving and curb, 15,470 sq. yds., 4 streets.	John J. Mannion, City Clerk.
Indiana	Vincennes	March 10	Constructing 5 blocks cement sidewalk and curbing.	John J. Mannion, City Clerk.
New York	Brooklyn	March 11, 11 A.M.	Furn. 500 net tons refined asphalt; rail fences on streets.	John J. Mannion, City Clerk.
New Jersey	Paterson	March 11, 2 P.M.	Maca lamizing Midvale road, Boardville to W. Milford twp.	John J. Mannion, City Clerk.
New Jersey	Farmingdale	March 11	Blig. stone road 1, 1,400 ft. long; also 3 miles gravel road.	John J. Mannion, City Clerk.
New York	Buffalo	March 11	Paving 2 sts., repairing 2; maca lamizing one street.	John J. Mannion, City Clerk.
Iowa	Des Moines	March 11	Constructing brick and cement walks during 1908.	John J. Mannion, City Clerk.
Louisiana	Port Hudson	March 12, 10 A.M.	Repairing roadway, bridge and culvert to Nat'l Cemetery.	John J. Mannion, City Clerk.
Mississippi	Vicksburg	March 12, 10 A.M.	Repairing roadway leading to Nat'l Cemetery.	John J. Mannion, City Clerk.
Michigan	Saginaw	March 12	Paving portions 21 sts., 115,000 sq. yds., inc. curb, grading, drainage, with asphalt, brick, wood block, etc., all on concrete or macadam.	John J. Mannion, City Clerk.
Ohio	Cincinnati	March 13, noon	Improving Edmunson road from Edwards to Duck Creek road.	John J. Mannion, City Clerk.
Maryland	Baltimore	March 14, 11 A.M.	Macadam, gra. le, curb, gutter, Whiteford St.	John J. Mannion, City Clerk.
Wisconsin	Watertown	March 14, 2 P.M.	Improving portions Main, Church and N. Church Sts.	John J. Mannion, City Clerk.
Indiana	Indianapolis	March 14	Grading and paving walks Broadway, Norwood and 12 other streets.	John J. Mannion, City Clerk.
Iowa	Des Moines	March 14	Paving 2,120 sq. yds. brick on concrete, W. 19th Street.	John J. Mannion, City Clerk.
North Carolina	Wilson	March 15	Laying 90,000 sq. ft. granolithic sidewalks.	John J. Mannion, City Clerk.
Ohio	Zanesville	March 16, noon	Pave and curb Putnam Ave.; brick or asphalt Brtn. Blvd.	John J. Mannion, City Clerk.
Michigan	Meioninee	March 16, 5 P.M.	Brick paving, Ludington Ave.; macadam 2 streets.	John J. Mannion, City Clerk.
Dist. of Col'bia	Washington	March 16	Grading at Arlington Nat'l Cemetery, Virginia.	John J. Mannion, City Clerk.
Iowa	Clinton	March 16	Brick paving on concrete, 2,550 sq. yds.; 1,150 ft. curb and gutter.	John J. Mannion, City Clerk.
Iowa	Des Moines	March 16	Improving Prospect Blvd., inc. 2,600 ft. curb and gutter.	John J. Mannion, City Clerk.
West Virginia	Huntington	March 16	Brick paving, 84,000 sq. yds.; curb, 36,000 lin. ft. curb, grading, etc.	John J. Mannion, City Clerk.
South Carolina	Laurens	March 16	Brick paving, 9,671 sq. yds.; cement walks, 2,991 sq. yds., etc.	John J. Mannion, City Clerk.
Wisconsin	Neenah	March 16	Constructing 9,000 yds. brick paving, Wisconsin Ave.	John J. Mannion, City Clerk.
Indiana	Gary	March 17, 2 P.M.	Macadamizing several streets.	John J. Mannion, City Clerk.
New Jersey	Toms River	March 17	Blig. 24,633 ft. gravel road in Dover and Buck townships.	John J. Mannion, City Clerk.
Indiana	Winchester	March 18	Improving various streets.	John J. Mannion, City Clerk.
North Carolina	Newbern	March 19	Constructing about 20 miles of concrete sidewalks.	John J. Mannion, City Clerk.
Ohio	Cincinnati	March 20	Repairing number of pike roads in County.	John J. Mannion, City Clerk.
Kentucky	Ashland	March 23	Brick or bitulithic, 12,500 sq. yds. conc. curb and gutter, 6,600 feet.	John J. Mannion, City Clerk.
Indiana	Valparaiso	March 27, 8 P.M.	Constructing 36,619 sq. yds. brick, 11,211 with sand, and 25,328 with asphalt filler; all on macadam; cement curb.	John J. Mannion, City Clerk.
<b>Water Supply</b>				
New York	New York	March 4, 2 P.M.	Furn. and deliver iron castings for Boro. of Brooklyn.	John J. Mannion, City Clerk.
New Jersey	Gloucester	March 5, 8 P.M.	Laying water mains with valves, boxes, fire hydrants, 9 streets.	John J. Mannion, City Clerk.
Ohio	Columbus	March 6	Furn. 850 tons 24-in. c. i. pipe; 20 tons pig lead; 20 tons specials.	John J. Mannion, City Clerk.
Georgia	Rome	March 9, noon	Gravity filter, 500,000 gal. capacity per 24 hours.	John J. Mannion, City Clerk.
Indiana	Elkhart	March 11, 10 A.M.	Furn. for 25 yrs. from April 28, 1909, ample supply of water for all domestic and public uses, inc. fire protection.	John J. Mannion, City Clerk.
Virginia	Petersburg	March 12, noon	Blig. 60,000-gal. steel water tower; plans by March 8.	John J. Mannion, City Clerk.
Kansas	Kansas City	March 12	Erecting 27,000 gal. steel tank and 1 tower, Sch. for Blind.	John J. Mannion, City Clerk.
British Col'bia	Vancouver	March 16, 4 P.M.	Furn. pipe: 33,000 ft. 12-in.; 18,000 ft. 8-in.; 36,500 ft. 6 in.; 25,000 ft. 4-in.	John J. Mannion, City Clerk.
New Jersey	Mendham	March 16, 8 P.M.	Constructing water works system; also for furn. 510 tons c. i. pipe, 8 tons specials, 38 double-nozzle fire hydrants, 44 valves, 30 automatic air valves, 37 valve boxes.	John J. Mannion, City Clerk.
Pennsylvania	Philadelphia	March 17	Auxiliary pump for filter plant; pump ends, pipe connections, and track scales; contracts, 130, 140, 141, 142.	John J. Mannion, City Clerk.
California	Oakland	March 18, 11 A.M.	Labor and material for constructing salt water pumping plant; specifications, etc., at MUN. JOUR.	John J. Mannion, City Clerk.
Quebec	Montreal	March 24, noon	Furn. and erect, 12,000,000 Imp. gal. steam pump.	John J. Mannion, City Clerk.
Massachusetts	Springfield	March 25, 2 P.M.	Blig. sed. basin, 6 covered masonry filters, bldgs., etc.	John J. Mannion, City Clerk.



## Water Supply—Continued.

South Dakota..	Pine Ridge Ag'cy	March 26, 2 P.M.	Furn. and erect. 25,000-gal. steel water tank and tower.....	Com'r Ind. Aff'rs, Wash., D. C.
New York.....	McGraw.....	March 30.....	Constructing water works for village of McGranville.....	W. G. Stone, Mann Bldg., Utica, C.E.

## Sewerage

New Jersey....	Newark.....	March 5, 3:30 P.M.	Bldg. 31,035 ft. 15 to 6-in. vit. pipe sewer, etc.....	M. R. Sherrerd, Ch. Engr. St. & W. Board.
New Jersey....	Gloucester.....	March 5, 8 P.M.	Bldg. 16 x 22-in. brick sewer, Somerset St.; terra cotta sewers, 8 streets.....	A. Aden Powell, City Engineer.
New York.....	New York.....	March 5.....	Rebldg. sewer in Whitlock St., inc. 725 cu. yds. brick work, etc.....	Louis F. Haifen, Pres. Boro. Bronx.
Ohio.....	Norwalk.....	March 6.....	Constructing 5 sewers in different streets.....	T. P. Kellogg, Clk. Bd. Pub. Serv.
Ohio.....	Oakley.....	March 7, noon.....	Constructing sewers in portions of Gilmore Ave.....	A. E. Burkhardt, Village Clerk.
Pennsylvania..	E. McKeesport..	March 7, 4 P.M.	Plans, etc., for sanitary sewer system.....	John R. Romaine, Boro. Eng'r.
Indiana.....	Gary.....	March 10, 2 P.M.	Constructing several sewers.....	C. O. Holmes, Clk. Bd. Trustees.
Iowa.....	Clinton.....	March 10.....	Constructing 12.6 miles 8 to 48-in. sewers; cost, \$90,000 to \$100,000.....	Charles P. Chase, City Engineer.
Ohio.....	Marion.....	March 10.....	Furn. & bldg. sanitary sewer and cellar drain Columbia St. and Reade Ave.; also brick or concrete storm water sewer.....	C. M. Tobin, Clk. Bd. Pub. Serv.
Kentucky.....	Louisville.....	March 12, noon.....	Bldg. Sec. A, Beargrass interceptor, mainly 2,109 ft., 5' 8" x 5' 4", 2,447 ft., 6' 11" x 6' 6"; exc., 2,510 lin. ft., open cut; 2,120 ft. in tunnel; concrete, 3 classes, 3,500 cu. yds.; piles, 24,000 lin. ft.; rein. steel bars, 126,000 lbs.....	J. B. F. Breed, City Engineer.
Missouri.....	Jefferson Bar'cks.	March 14.....	Constructing water and sewerage systems at barracks.....	O. W. Bell, Q. M., U. S. A.
Michigan.....	Menominee.....	March 16, 5 P.M.	Constructing sewers in sundry streets.....	F. S. Norcross, City Clerk.
California.....	Patton.....	March 16, 8 P.M.	Improving, etc., storm water channels, St. Hosp. grounds.....	Dr. A. P. Williamson, State Hospital.
Tennessee.....	Chattanooga.....	March 17, 2:30 P.M.	Bldg. sewer, Chestnut St., inc. 3,900 ft. egg-shaped sewer, 44 x 66-in. to 63 x 94-in. and 175 ft. 72-in. circ. sewer.....	H. F. Van Dusen, Chm. Bd. Puk. W's.
New York.....	Auburn.....	March 17, 8 P.M.	Bldg. sewers and disposal plant; 4 wards, \$100,000, inc. 14,700 ft. 8 in., 11,300 ft. 10 in.; 6,000 ft., 20 in.; 3,600 ft., 15 in.; 300 ft. 18 in.; 1,250 ft. 20 in.; 16,000 cu. yds. exc., 5 to 18 ft. deep; 17,000 ft., 5-in. vit. tile; also 20,000 ft., 4 in.; 6,000 ft., 6 in.; 7,000 ft., 8 in.; 2,000 ft., 10 in.; 200 ft., 12 in., of seconds; 84 manholes, 9 ft. deep; 12 flush tanks; 12 lamp holes; also reinforced concrete septic tanks and contact beds and auto. closing appliances.....	W. Thomas Wooley, City Engineer.
California.....	Oakland.....	March 18, 11 A.M.	Bldg. inter. sewer, 3d St., bet. Myrtle & Union Sts.; outlet Linden Street.....	W. B. Fawcett, Sec'y Bd. Pb. Wks.
Kansas.....	Wellington.....	March 23.....	Furn. mat. & bldg. 3 1/2 miles 6, 8, 10, 12-in. pipe.....	H. A. Rowland, McPherson, C. E.
Ohio.....	Jackson.....	March 25.....	Bldg. 1 1/2 miles sanitary sewers; estimated cost, \$15,000.....	J. W. Turner, Village Engineer.
Pennsylvania..	St. Marys.....	March 30, 8 P.M.	Bldg. system double-strength vit. pipe, sanitary sewers: 3,531 ft., 15-in.; 5,605 ft., 12-in.; 6,189 ft., 10-in.; 40,852 ft., 8-in.; 184 manholes, 38 flush tanks; cont. let for furn. material.....	L. C. Hanhauser, Boro. Secretary.
Nebraska.....	Holdrege.....	April 3.....	Furn. mat. & bldg. complete sanitary sewer system.....	M. A. Earl & Co., Muskogee, Okla., Engineers.
Illinois.....	Anna.....	May 1.....	Constructing sanitary sewers, to cost \$20,000.....	J. L. Hammond, City Clerk.

## Public Buildings

New York.....	New York.....	March 5, 11 A.M.	Rebuilding, etc., interior Queens Co. Court House, L. I. City.....	Jos. Bermel, Pres. Boro. Queens.
Minnesota.....	Red Wing.....	March 5, 3 P.M.	Constructing, complete, U. S. Post Office.....	James Knox Taylor, Wash., D. C.
South Dakota..	Chamberlain.....	March 5.....	Furn. material and enlarging dormitory at Indian School.....	S. A. M. Young, Supt. Indian School.
Michigan.....	Dighton.....	March 5.....	Erecting brick or cement school; plans at Faye Webster's store.....	Board of Education.
New York.....	New York.....	March 5.....	Erecting library wing addition to Met. Museum of Art.....	Park Department.
Wisconsin.....	E. Milwaukee.....	March 5.....	Erecting a school; Fred Graf, Matthews Bldg., Mil., Archt.....	E. Weickhardt, Clk. Sch. Bd.
Michigan.....	Mt. Pleasant.....	March 6, noon.....	Physical training bldg. for Cen. Mich. Normal School.....	E. W. Arnold, Battle Creek, Arch.
Ontario.....	Haileyburg.....	March 6.....	Erecting public school; A. D. Pillar, Architect.....	J. I. Rankin, Sec'y Bd. Education.
Pennsylvania..	Allghany.....	March 6.....	Erecting Seventh Ward School; revised plans.....	F. C. Sauer, Pittsburgh, Archt.
Dist. of Col'bia.	Washington.....	March 7, noon.....	Bldg. 12-room school, B St., bet. 13 and 14th Sts., S. E.....	Jay J. Morrow, Eng'r Com'r's.
Washington.....	Seattle.....	March 7, noon.....	Erecting Oregon State Bldg. for Exposition.....	David C. Lewis, Portland, Ore., Arch.
Louisiana.....	Marksville.....	March 9, noon.....	Bldg. 2-story and basement brick school.....	Favrot & Livaudais, Ltd., New Orleans, Architects.
Kansas.....	Nat'l Mil. Home.	March 9, noon.....	Constructing combination barrack.....	Maj. W. W. Martin, Treasurer.
Illinois.....	Dixon.....	March 9, 1 P.M.	Bldg. school; Spencer & Temple, Champaign, Archts.....	E. W. Smith, Sec'y Bd. Educ.
Alabama.....	Fort Morgan.....	March 9, 3 P.M.	Constructing new bldgs., etc., P. H. & M. H. S. Mobile Quar.....	Edward Francis, Medical Officer.
New York.....	New York.....	March 9.....	Completing abandoned Court found., etc., Munic. Lodg. House.....	Robt. W. Hebbert, Com'r Charities.
Massachusetts.	Winthrop.....	March 9.....	Furn. material and bldg. brick grammar school.....	W. M. Bacon, 27 Kilby St., Boston, Architect.
Alabama.....	University.....	March 9.....	Erecting engineering bldg.; also museum bldg., Univ. Ala.....	Frank Lockwood, Arch., Montgomery.
Ohio.....	Lima.....	March 10, noon.....	Erecting 2-story juvenile bldg., Allen Co. Children's Home.....	Leach & Leach, Architects.
California.....	Cahuilla.....	March 10, 2 P.M.	Constructing school at Cahuilla Indian School.....	C. L. Swain, Aquanga, Supt. Ind. Sch.
South Carolina.	Greenville.....	March 10, 3 P.M.	Extending, remodeling, etc., Federal Building.....	James Knox Taylor, Wash., D. C.
Iowa.....	Clinton.....	March 10, 8 P.M.	Erecting fire station at No. 4; separate bids for heating.....	William E. Hayes, City Clerk.
Ohio.....	Conneaut.....	March 10.....	Constructing new high school; cost, \$70,000.....	R. E. Mygatt, Clk. Bd. Educ.
Alabama.....	Auburn.....	March 10.....	Erecting library bldg. for Ala. Polytechnic Institute.....	Wm. F. Peagin, Sec'y Bldg. Com.
Pennsylvania..	Meia.....	March 10.....	Erecting State armory, according to revised plans.....	Price & McLanahan, Phila., Archt's.
New York.....	Brooklyn.....	March 10.....	New plumbing station, male prison, etc., Kings Co. jail.....	J. V. Coggey, Com'r Correction.
Wisconsin.....	La Crosse.....	March 12, 10 A.M.	Erecting normal school building.....	J. A. Peacock, Pres. Reg. Norm. Sch., Madison.
Wisconsin.....	Milwaukee.....	March 12, 10 A.M.	Erecting normal school building.....	Van Ryn & De Gelleke, Archts.
Indiana.....	Indianapolis.....	March 12, 1 P.M.	Constructing school, Sugar Grove Ave. and 21st St.....	John E. Cleland, Bus. Dir. Sch. Comr.
New York.....	Rochester.....	March 12, 3 P.M.	Constructing, complete, except elevator, exten. to Federal Bldg.....	James Knox Taylor, Wash., D. C.
Minnesota.....	Pipestone.....	March 12.....	Erecting hospital building at Indian School.....	W. S. Campbell, Supt. Ind. School.
Pennsylvania..	Indiana.....	March 12.....	Erecting \$75,000 school; C. C. & A. L. Thayer, New Castle, Arch.	E. M. Lockhard, Pres. School Bd.
Massachusetts.	Springfield.....	March 14.....	Bldg. Kensington Ave. school; also heating, etc.; cost, \$90,000.....	B. F. Seabury, Architect.
Nebraska.....	Hastings.....	March 14.....	Erecting \$17,000 Carnegie Library and Science Bldg.....	Oswald Oliver, Chm. Bldg. Com.
Indiana.....	Anderson.....	March 14.....	Erecting \$125,000 high school, R. P. Daggett & Co., Architects.....	J. D. Peary, Supt. School Bd.
Iowa.....	Des Moines.....	March 14.....	Erecting new City Hall, to cost about \$250,000.....	Proudfoot & Bird, Crocker Bldg. Architects.
Idaho.....	Buhl.....	March 14.....	Bldg. 8-room school; also heating and plumbing; Dist. No. 12.....	H. S. Hobson, Chm. School Bd.
California.....	Hollister.....	March 14.....	Bldg. Co. high school; plans by W. H. Weeks, Watsonville.....	J. H. Garner, Ch. Superintendent.
New York.....	Albany.....	April 15, 5 P.M.	Competitive plans for new State Prison at Sing Sing; 30 fire-proof bldgs. in group; 1,400 cells; cost, \$2,000,000.....	Chas. F. Howard, Pres. Com'n New Prisons.
Wisconsin.....	Green Bay.....	March 16, 10 A.M.	Erecting Co. jail, sheriff's residence and power house.....	Foeller & Schober, Paul Foxblk., Architects.
Arizona.....	Florence.....	March 16, noon.....	Bldg. \$120,000 prison; 600 ft. square enclosure, stone, brick or reinforced concrete, 16 ft. high; bldgs. 46 x 186 ft.....	Jas. F. Riggs, Sec'y Terry Bd. Cont'l.
Florida.....	Pensacola.....	March 16, 3 P.M.	Bldg. quarters and hospital bldgs. Santa Rosa Quar. Station.....	James Knox Taylor, Wash., D. C.
Nebraska.....	Superior.....	March 16.....	Erecting \$45,000 high school; John Latensen, Omaha, Arch.	M. L. Pierce, Sec'y School Board.
North Carolina.	Greensboro.....	March 16.....	Erecting brick Science bldg. for St. Normal & Indus. College.....	J. L. Forest, Pres. Bd. Trustees.
Ohio.....	Delaware.....	March 17, noon.....	Bldg. brick hospital for Girls' Industrial Home Trustees.....	Marriott & Allen, Archts., Columbus.
North Dakota..	Rolette.....	March 17, 7 P.M.	Bldg. brick school for Leonard School, Dist. No. 9.....	J. A. Shannon, Archt., Devils Lake.
Rhode Island..	Providence.....	March 18, noon.....	Erecting several bldgs. for City Hospital, etc.....	French & Hubbard, Boston, Mass., Engineers.
New York.....	Ravenna.....	March 18, noon.....	Furnishing material and building school.....	Fuller & Pitcher, Albany, Archts.
North Dakota..	La Moure.....	March 18, 2 P.M.	Erecting Co. jail; also basement for new Court House.....	E. W. Field, County Auditor.
California.....	Los Angeles.....	March 18, 3 P.M.	Hot-water heat, ventilating apparatus, etc., Federal Building.....	James Knox Taylor, Wash., D. C.
Minnesota.....	Iowa.....	March 18, 8 P.M.	Erecting combined lock-up and fire hall.....	Wells E. Bennett, La Crosse, Wis., Architects.
New Jersey....	Sandy Hook.....	March 19, 2 P.M.	Constructing barracks at Fort Hancock.....	Quartermaster U. S. A.
North Dakota..	Knox.....	March 20, 4 P.M.	Bldg. 4-room brick school; also steam-heat plant.....	Haxby & Gillespie, Archt., Fargo.
Washington.....	Puget Sound.....	March 21, 11 A.M.	Erecting 3 bldgs. for Naval Hospital at navy yard.....	Commandant, Navy Yard.
Pennsylvania..	Mt. Pleasant.....	March 22.....	Bldg. 2-story high school, 85 x 100 ft.; cost, \$35,000.....	W. G. Sloan, Greensburg, Arch.
Wisconsin.....	Rhineland.....	March 23, 2 P.M.	Bldg. fireproof Co. Court House; cost, \$100,000.....	Arthur Taylor, Chm. Bldg. Com.
Virginia.....	Richmond.....	March 23.....	Erecting combined market and armory building; cost, \$100,000; also designs, drawings, etc.....	C. E. Bolling, City Engineer.
Ohio.....	Toledo.....	March 23.....	Bldg. 4-room addition to South St. School, etc.....	Geo. L. Mekesson, Dir. of Schools.
North Dakota..	Devils Lake.....	March 24, 3 P.M.	Constructing, completely, Federal Building.....	James Knox Taylor, Wash., D. C.
Michigan.....	Gand Rapids.....	March 24, 3 P.M.	Constructing, except elevators, Federal Building.....	James Knox Taylor, Wash., D. C.
Ohio.....	Columbus.....	March 30.....	Erecting Indianola School; cost, \$65,000.....	David Kiebel, Architect.

## Bridges

Colorado.....	Malta.....	March 6, noon.....	Bldg., complete, two 35-ft. spans, concrete arch bridge.....	T. W. Jaycox, State Eng'r, Denver.
Ontario.....	Alvinston.....	March 6, 3 P.M.....	Bldg. various bridges, Brook Township, Lambton Co.....	A. S. Coce, County Engineer.
Minnesota.....	Fergus Falls.....	March 6, 8 P.M.....	Bldg. rein. concrete bridge; also with plans, etc.....	C. A. P. Turner, Minnpls., C. E.
Ohio.....	Cleveland.....	March 7, 11 A.M.....	Bldg. concrete abutment; also steel-concrete culvert.....	A. B. Lea, County Surveyor.
Nebraska.....	Omaha.....	March 7, noon.....	Repairing and bldg. wooden pile and steel bridges during year.....	D. M. Haverly, County Clerk.
Alabama.....	Birmingham.....	March 10, noon.....	Furnishing material and constructing 8 steel or reinforced concrete highway bridges.....	P. S. Milner, County Engineer.
Manitoba.....	Dunrea.....	March 10, noon.....	Bldg. two 100 ft. steel and concrete spans, Souris River.....	J. H. Putnam, Sec'y Treas.
New York.....	Buffalo.....	March 10.....	Erecting additional counterweights Mich. Ave. basc. br.....	F. G. Ward, Com'r Pub. Works.
Louisiana.....	Port Hudson.....	March 12, 10 A.M.....	Repairing bridge and culvert leading to Nat'l Cemetery.....	Capt. Arthur Cranston, U. S. A., New Orleans.
Ohio.....	Cleveland.....	March 14, 11 A.M.....	Constructing steel-concrete bridge in Euclid township.....	A. B. Lea, County Surveyor.
Indiana.....	Brookville.....	March 14, 1 P.M.....	Constructing various arches and bridges in Franklin County.....	Charles A. Miller, Co. Auditor.
Ohio.....	Nottingham.....	March 14.....	Bldg. superstructure, rein. concrete bridge; cost, \$12,768.....	A. M. Felgate, Cleveland, Des. Eng'r.
Oregon.....	Grants Pass.....	March 16, 10 A.M.....	Bldg. steel bridge over Rogue river; new plans wanted.....	S. F. Cheshire, County Clerk.
Wisconsin.....	Milwaukee.....	March 17, 10:30 A.M.....	Bldg. bascule bridge over Kinnickinnic River; \$40,000 bond.....	C. J. Poetsch, City Engineer.
Michigan.....	Benton Harbor.....	March 19, 2 P.M.....	Bldg. steel bridge over St. Joseph river, inc. swing or bascule channel and 2 approach spans and concrete substructure; 312 ft. long, 32 ft. roadway, wood block paving, two 7-ft. walks.....	J. W. Pearl, Eng'r Jt. Br. Com'l.
New Brunswick.....	Coverdale.....	March 23.....	Bldg. Mill Creek Mouth bridge in Albert Co.....	C. H. La Billois, Pub. Works Dep't.
Minnesota.....	Redwood Falls.....	March 25.....	Constructing 220-ft. bridge over Minnesota River.....	L. P. Larson, County Auditor.
Minnesota.....	Watertown.....	March 31.....	Furn. 7,000 ft. white oak bridge plank, 3-in. thick, 16 ft.....	J. F. Boylan, Village Recorder.
Alaska.....	Sitka.....	April 1, noon.....	Bldg. suspension bridge over Indian River, near Sitka.....	Lt. Sam C. Orchard, U. S. A., Skag'y.
South Dakota.....	Brookings.....	April 8, 2 P.M.....	Material and labor for building 28-ft. cement bridge.....	P. J. Murphy, Co. Auditor.

## Lighting and Electricity

Massachusetts.....	Boston.....	March 6.....	Electrical work at Almshouse and Hospital, L. I., in harbor.....	Edw. M. Gallagher, Chm. D. P. I.
Washington.....	Bremerton.....	March 10.....	Two 10-ton, 3-motor electric traveling cranes.....	Commandant Navy Yard.
Wisconsin.....	Green Bay.....	March 16, 10 A.M.....	Erecting and completing power house for Brown County.....	Foeller & Schober, Architects.
Wisconsin.....	Sheboygan Falls.....	March 16, 7:30 P.M.....	For 25-yr. franchise for establishment, maintenance and operation of electric light plant and system.....	Pres. and Trustees of Village.
Minnesota.....	Minneapolis.....	March 16.....	Furn. electric or acetylene light plant for Co. Farm.....	Hugh R. Scott, Co. Auditor.
California.....	Los Angeles.....	March 17, 3 P.M.....	Installing conduit and electric wiring system, Federal Building.....	James Knox Taylor, Wash., D. C.
Illinois.....	N. Chicago.....	March 18, noon.....	Power plant equipment, in power house, Naval Train. Station.....	Admiral J. E. Pillsbury, Wash., D. C.
Delaware.....	Wilmington.....	March 31.....	Lighting streets by gas and electricity for 5 yrs. from Sept. 1, inc. electrical energy for 350 arc and 428 incan. lamps.....	Howard B. Griffith, City Engineer.
Indiana.....	Mt. Vernon.....	April 1.....	Lighting streets for 10 yrs., from July 1, 1909 with electric lights, plant to consist of 85 2,000 c.p. enclosed arc lamps; 11 yr. franchise for commercial and residence lighting, 900 with contract.....	Henry Kling, City Clerk.
Dist. of Col'bia.....	Washington.....	April 6.....	Furn. electrical sup. to Bur. E. & Pr., 1 year from July 1.....	Director Sullivan, B. E. & P.
Louisiana.....	Lecompte.....	April 7.....	Bldg. electric light plant, to cost \$10,000, steam operated.....	W. H. Jones, City Clerk.
Texas.....	Fort Worth.....	April 7.....	1,280 c. p. 6.6 ampere a. c. arc lamps, complete, with inner and outer globes; lamps for street lighting, 250, 500 or 750 lamps. Foundation, furnishing, erecting, etc., 650 kw., 3-phase, 60-cycle, 2,300-volt a.c. generator with exciter; 10 current transformers, cap. 100 6.6 ampere arc each; switchboard panels for 20 circuits of 50 arc each; exciter and generator panel; all wiring and pipe-fitting by city; also alternate bids.....	J. J. Nunnally, City Auditor.
Georgia.....	Lafayette.....	May 1.....	Constructing electric lighting plant.....	J. J. Nunnally, City Architect. J. A. Clements, City Recorder.

## Miscellaneous

New York.....	New York.....	March 5, 3 P.M.....	Erecting 3 rail pipe fences in City Hall Park, etc.....	Park Department.
Montana.....	Bozeman.....	March 5, 5 P.M.....	Furn. 500 ft. 2 1/2-in. cotton fire hose.....	Harry A. Bolinger, City Clerk.
Pennsylvania.....	Harrisburg.....	March 6, 2:30 P.M.....	Bldg. works to control floods in Paxton Creek Valley, etc.....	James H. Fierles, N. Y. City, Cons. Engineer.
Indiana.....	Indianapolis.....	March 7.....	Furn. steam road roller with full specifications.....	Albert Salem, Co. Auditor.
Minnesota.....	Minneapolis.....	March 9, 11 A.M.....	Bldg. bulkhead at Narrows, Lake Minnetonka.....	Hugh R. Scott, Co. Auditor.
Ontario.....	Ottawa.....	March 10, noon.....	Bldg. sections of Transcontinental R.R.....	P. E. Ryan, Sec'y Trans. R.R. Com'rs.
Michigan.....	Detroit.....	March 10, noon.....	Furnishing brick and lumber for 1908.....	Benj. F. Guiney, Sec'y Water Com'rs.
South Carolina.....	Spartanburg.....	March 10, noon.....	Furnishing hook and ladder truck.....	E. S. Kennedy, Chief Fire Dep't.
Dist. of Col'bia.....	Washington.....	March 11, noon.....	Window frames and sashes for Senate Office Bldg.....	Elliott Woods, Supt. Capitol.
Maryland.....	Baltimore.....	March 11.....	Constructing piers 4, 5 and 6; plans, etc., for \$15.....	Harbor Board.
Dist. of Col'bia.....	Washington.....	March 12, 10:30 A.M.....	Furn. Portland cement; 4,500,000 bbls. to be used.....	Col. H. F. Hodges, Ist. Canal Com.
Florida.....	Key West.....	March 12, 11 A.M.....	Furnishing 125 h.p. steam boiler, with accessories.....	Capt. Conrad H. Lanza, Q. M. U. S. A.
New York.....	Brooklyn.....	March 12, 3 P.M.....	Repairs and alterations and painting fences, parks and p'kways.....	Dept. of Parks, New York City.
Ontario.....	Peterboro.....	March 12.....	Work on Sec. 3, Ontario-Rice Lake Div. Trent Canal.....	L. W. Jones, Ottawa, Sec'y D.R. & C.
Pennsylvania.....	Scranton.....	March 14, 10:30 A.M.....	Removal, disposal of garbage, ashes, rubbish, 5 years.....	F. L. Wormser, Dir. Pub. Safety.
Florida.....	Fort Taylor.....	March 14, 11 A.M.....	Constructing a wharf.....	Capt. C. H. Lanza, Key West, Q. M. U. S. A.
Dist. of Col'bia.....	Washington.....	March 14, noon.....	Furn., etc., direct radiators for hot water heating, Senate Office building.....	Elliott Wood's, Supt. Capitol.
New York.....	Buffalo.....	March 14.....	Constructing concrete walls for ship lock.....	H. M. Adams, Eng'r Corps U. S. A.
Michigan.....	Sault Ste. Marie.....	March 15.....	Widening Sault Ste. Marie canal.....	U. S. Engineer, Detroit.
California.....	Los Angeles.....	March 19, 3 P.M.....	Installing vacuum cleaning system, Federal Building.....	James Knox Taylor, Wash., D. C.
New York.....	Fort Wood.....	April 1, 2:45 P.M.....	Constructing storage dock and timber wharf.....	G. C. Burnell, Q. M. U. S. A.

## STREET IMPROVEMENTS

**Little Rock, Ark.**—The property owners on Scott street have petitioned for the surfacing of the street with asphalt.—Address City Clerk.

**Hartford, Conn.**—Council has authorized the Board of Finance to include in its budget the sum of \$3,000 for macadamizing Prospect avenue, northerly from Asylum avenue.

**New Haven, Conn.**—The Paving Commission has \$250,000 on hand to be used in paving in the year 1908.—Max Adler, Paving Commissioner.

**Washington, D. C.**—The House has passed House Bill 11,776, for the opening of Jefferson and Fifth streets northwest; House Bill 11,767, for the extension of Kenyon street from Seventeenth street to Mount Pleasant street, and for the extension of Seventeenth street from Kenyon street to Irving street; House Bill 4,060, authorizing the extension of Oak street northwest.

**Gainesville, Ga.**—The citizens of Hall County propose to issue \$150,000 bonds for macadamizing roads.—Address County Commissioners.

**Albany, Ga.**—Bids will be received, March 10, for the purchase of \$85,000 street improvement bonds; interest, 5 per cent.—Y. C. Rust, City Clerk.

**Atlanta, Ga.**—The Street Committee of Council has made a favorable report for paving certain streets.

**Wallace, Ida.**—George R. Trask, County Surveyor, states that bids will be called for in the spring for constructing the St. Joe wagon road, about 18 miles in length; probable cost, \$20,000.

**Bloomington, Ill.**—The City Engineer has been directed to prepare plans and specifications for improving certain streets by paving with brick.—Address City Clerk.

**Blue Island, Ill.**—Bids were rejected for paving sundry streets; may readvertise.—Victor Homan, Village Clerk; C. N. & V. B. Roberts, Engineers, 97 Clark street.

**East St. Louis, Ill.**—City Engineer Wm. J. Crocker is preparing plans for paving various streets with brick, on concrete foundations, at a cost of \$60,000.

**Elgin, Ill.**—City Engineer C. E. Plum is preparing plans and specifications for 20,000 square yards of asphalt and 41,000 square yards of brick paving; bids are being received.

**Lincoln, Ill.**—An overhead crossing was ordered put in by the Lincoln, Peoria and Springfield Traction Company at its crossing at Lincoln of the tracks of the Illinois Central and Chicago and Alton Railroads, by the State Board of Railway and Warehouse Commissioners.—E. B. Balty, Mayor.

**Mt. Carmel, Ill.**—Guy W. Courter, C.E., has been engaged by the Board of Local Improvements to prepare plans for five miles of vitrified brick pavement.

**Peoria, Ill.**—The Board of Public Works

has decided to pave certain portion of East Locust street, at a cost of \$7,200.—Isaac J. Leavinson, Clerk of the Board.

**Rock Island, Ill.**—The Board of Local Improvements is planning work for the coming season; the Board is now working on plans for continuing the asphalt paving of Seventh avenue; the proposition to continue the brick paving on Twenty-third street is in Court, and the Board is also considering steps for the paving of Ninth street, from Third avenue south to the city limits; another paving project under consideration is the improvement of Forty-second street with asphalt, while hearings on the paving of Tenth and Eleventh avenues with asphalt will also be held soon.—Address Clerk of the Board.

**Taylorville, Ill.**—Engineer J. W. Dappert is preparing plans for paving for the Board of Local Improvements, A. J. Kinney, President, for four miles of paving from 20 to 30 feet wide, on 6-inch concrete base, with asphalt filler and combined curb and gutter.

**Bedford, Ind.**—No contract was let by the Board of Commissioners of Lawrence County, for the construction of macadam roads, as follows: Marion Township, five roads, 10,453, 11,650, 968, 2,000 and 1,745 feet in length, respectively; one road in Spice Valley Township, 1,862 feet in length.—Walter G. Owens, County Auditor.

**Evansville, Ind.**—The Board of Public Works has passed resolutions for the improvement of Emmet street, from Madison



avenue to Second street, and Chandler avenue, from Eighth street to Elliott street, by grading, curbing, guttering and paving with asphalt for a width of thirty feet.

**Indianapolis, Ind.**—Council passed ordinances providing for bitulithic and asphalt paving and cement walks on numerous streets in the city; bids will be advertised shortly.—Blaine H. Miller, City Engineer.

**Kentland, Ind.**—The Commissioners of Newton County will soon ask for bids for the construction of five miles of rock roads in McClelland and Colfax Townships; estimated cost, about \$2,250 per mile.

**Morocco, Ind.**—The Commissioners of Newton County will soon ask for bids for the construction of five miles of stone road in McClelland and Colfax Townships; estimated cost, \$2,500 per mile.

**Muncie, Ind.**—It is proposed to pave portions of Main and Liberty streets with brick, about 20,000 square yards.—John Potter, City Engineer.

**Red Oak, Ia.**—Preliminary plans are being prepared for 30,000 feet of curb and gutter.—C. M. Kelly, City Clerk.

**Elizabethtown, Ky.**—The Hardin County Fiscal Court has appropriated \$19,000 for the building of roads in Hardin.—Address County Clerk.

**Shreveport, La.**—Estimates are being prepared for improving many streets; an issue of \$600,000 in bonds is proposed.—Address Mayor Deinstein.

**Annapolis, Md.**—Senator Blair Lee has introduced the fourth State road bill that has been presented at the present session of the State Legislature. It calls for a road only two miles in length, but one that runs through four counties—Montgomery, Carroll, Frederick and Howard—being a road from Damascus to Mount Airy. Other State road propositions pending are for a road from Baltimore to Annapolis, one from Annapolis to Washington, and one from the Delaware line to the Virginia line on the eastern shore. The last Legislature authorized a State road from Baltimore to Washington, which is in course of construction.

**Lock Raven, Md.**—The Maryland School for Boys will expend about \$20,000 for road building and grading and construction of water supply system.—Maurice Sanphelmer, Secretary, 601 Calvert Building, Baltimore.

**Baltimore, Md.**—The Commissioners for Opening Streets have completed plans for the paving of North avenue, from Payson street to Twelfth street, Walbrook, at a cost of about \$135,000; the avenue is to be regraded, which will mean several heavy cuts and fills.

**Benton Harbor, Mich.**—The City Engineer has been directed to prepare plans and specifications for paving certain portions of West Main street; the material to be used has not been decided on.—Address City Engineer Dean.

**Detroit, Mich.**—Council decided to reject all proposals for furnishing paving brick for the ensuing year, and directed the Department of Public Works to readvertise for same; it is estimated that \$10,000,000 will be required.—J. J. Haarer, Commissioner.

Council has directed the Department of Public Works to advertise for proposals for paving, as follows: Mitchell avenue, from Canfield to Milwaukee avenue, 28 feet wide, with cedar blocks, on concrete; estimated cost, \$49,270. Fort street, from Green to Wilkes avenue, 60 feet wide, brick, on concrete, \$42,645. Helen avenue, from Champlain to Waterloo street, 26 feet, cedar, on concrete, \$20,605. Bellevue avenue, from Mack to Gratiot, 26 feet, cedar, on concrete, \$16,415. Green avenue, from Jefferson to Fort street, 26 feet, \$15,428. Trombly avenue, from St. Aubin to Joseph Campau, 26 feet, brick, on concrete, \$15,428. Euclid avenue, from Oakland avenue to Russell street, creosoted blocks, on concrete, 26 feet, \$15,416. Putnam avenue, from Twelfth to Fourteenth street, 26 feet, cedar, on concrete, \$7,730. Holbrook avenue, from John R. to Brush street, 28 feet, cedar, on concrete, \$5,635; all to have Medina, Berea or other approved curbing.—J. J. Haarer, Commissioner.

**Menominee, Mich.**—The City Engineer has been directed to prepare estimates for paving certain portions of Ludington avenue.

**Austin, Minn.**—Council was petitioned for creosoted block paving from the end of the present paving to Kenwood avenue.—Address City Clerk.

**St. Paul, Minn.**—The Park Board has directed estimates to be prepared for improving Reserve boulevard, three miles in length; preliminary plans were adopted on February 3 by the Board.—G. A. Johnson, City Engineer.

**Jefferson Barracks, Mo.**—Captain Bell, Quartermaster, has petitioned Congress for an appropriation of \$50,000 to build a highway from the city limits to the National Cemetery.

**Fremont, Neb.**—The city will soon take figures on five blocks of brick paving and concrete curbing.—S. F. Stiles, City Clerk.

**Lincoln, Neb.**—This city will let contracts for 5,000 square yards of brick paving and 9,000 square yards of asphalt paving.—William Grant, City Engineer.

**South Omaha, Neb.**—This city contemplates brick paving on Q street, from Thirty-third to Forty-fourth street; there will be 18,000 square yards of paving and 4,000 lineal feet curb and gutter; cost, \$40,000; bonds for sale.—J. J. Gillin, City Clerk; E. M. Rohrbach, City Engineer.

**Bayonne, N. J.**—The members of committee of the Broadway Improvement Committee are considering the merits of various materials to select a pavement for Broadway; brick, asphalt, wood block, bitulithic, Hassam and Hastings asphalt block pavements are among those which have been discussed.—E. G. Brown, Secretary of Committee; Pierre Garvin, Mayor.

**Camden, N. J.**—Councilman DeUnger has suggested to the Street Committee of Council that bonds to the amount of \$25,000 be issued for public improvements, that many idle men may be given work; City Engineer Farnham said the money could be easily used on grading streets, and the committee decided to ask Council for immediate action.

**Toms River, N. J.**—The Ocean Board of Freeholders has voted to advertise for bids for the construction of the northern section of the road on the beach peninsula, from Bay Head to Seaside Park.

**Albany, N. Y.**—The State of New York will receive bids, March 11, for the purchase of \$5,000,000 4 per cent., 50-year highway bonds.—Martin H. Glynn, State Comptroller.

**Buffalo, N. Y.**—Resolutions have been passed by Council ordering that various streets be paved and repaved.—Francis G. Ward, Commissioner of Public Works.

**Rochester, N. Y.**—The Board of Contract has rejected all bids received last year on street paving, the aggregate of which was over \$50,000, on account of a change in interest rate in the new charter; the contracts were not awarded last year because the work could not be started and Mayor Cutler decided to have the bids held up, with the idea the contracts were to be awarded this year; the White charter provided for an interest charge of only 5 per cent. and the new charter calls for 6 per cent. interest on assessments. As it would be necessary to keep to the 5 per cent. rate if the old bids were accepted, it was decided to throw all of them out and to advertise again. Council will be asked to repass these ordinances, changing the rate to 6 per cent., so there will be no legal question as to their validity.

**White Plains, N. Y.**—Bids will be received, March 16, for the purchase of \$44,000 5 per cent. sidewalk bonds, payable in the year 1913.—Peter Paulding, Clerk.

**Ashtabula, O.**—Council has taken the necessary steps to pave Sherman street, from Main to Chestnut street, and to grade and drain West Sibley street.—F. W. Wagner, Clerk.

**Cambridge, O.**—Council has approved plans for paving Clark street, bids to be advertised soon.

**Canfield, O.**—The citizens have voted \$50,000 bonds for building roads.—Address Town Clerk.

**Cincinnati, O.**—Bids will be received, March 16, for the purchase of \$195,500 4 per cent., 30-year Eighth street viaduct bonds.—Ernest Von Gagen, Auditor.

**Cleveland, O.**—Council is considering the expenditure of \$15,000 in elimination of grade crossings; also ordinance to appropriate \$10,000 to complete elevated roadway and bridge in Washington Park.—W. J. Springborn, President, Board of Public Service.

**Columbus, O.**—Lawson & Holbrook are preparing plans for concrete and cement walks, to lead from all buildings on State Fair grounds and connect various departments, grandstands, etc., for the State Board of Agriculture.—T. L. Calvert, Secretary, Board.

**Dayton, O.**—Bids will be received, March 16, for the purchase of \$22,000 street improvement bonds, interest 5 per cent., and \$7,500 storm sewer bonds, interest 4 per cent.—Edward Phillips, Auditor.

**Elyria, O.**—The Board of Public Service has ordered Cleveland, Southwestern and Columbus to pave Lake avenue and Spring street this spring.

**Gallon, O.**—The City Solicitor is drawing up ordinance for paving West Main street.

**Wooster, O.**—Council has passed ordinance for paving several streets; flagstone and cement to be used.

**Youngstown, O.**—Property owners have selected committee to insure good paving on Summit street; Bessemer brick to be used; Board of Public Service doing work.

**Lawton, Okla.**—The City Clerk has been directed to advertise for bids for laying thirty blocks of asphalt pavement.—Address City Clerk.

**Pendleton, Ore.**—Several streets will be paved as soon as the weather is favorable and a new City Hall will be built. The

first payment on \$35,000 bonds will soon be available. A part of the bond receipts will go to the payment for street pavement laid during the winter. When the streets have been paved that are now in line for improvement, all the country roads entering Pendleton will join on paved streets. The county is also working with the city to have the main thoroughfares graded and improved from the city limits out to the points where heavy traffic diverges.

**Pittsburg, Pa.**—The Appropriations Committee has authorized the issue of \$750,000 bonds for street repaving, but a fight will be made in the Finance Committee by Comptroller E. S. Morrow, who claims not more than \$200,000 can be used for the purpose during the year and it will be extravagant to allow the money to lie idle; Councilman J. C. Wason is urging the entire issue.

**Scranton, Pa.**—The plan of the County Commissioners for constructing a paved highway from the Luzerne county line at Durycia to the Susquehanna county line at Forest City, 26 miles, recommended by the Grand Jury, has been approved by Judge Edwards. The improvement will cost about \$600,000, to be paid for by an issue of county bonds and without increasing the tax rate, and the building of the road will be started this spring.

**Wilkes-Barre, Pa.**—The citizens have voted against issue of \$200,000 bonds for repaving Fifth avenue and Walnut street, after the ordinance had passed Council and been approved by Mayor Coleman.

**Orange, Tex.**—The citizens have voted \$16,000 bonds for street improvements.—Address City Clerk.

**Ballinger, Tex.**—An election will be held, March 17, to decide the question of issuing \$20,000 40-year, 5 per cent street bonds.—Address City Clerk.

**Taylor, Tex.**—Council has ordered a special election, March 17, for a vote of the taxpayers of the city upon the issuance and sale of 40-year, 5 per cent. municipal bonds in the sum of \$25,000 for the general improvement of the streets.

Chairman T. W. Marse, of the Main street macadamizing committee, reported progress in the subscription of funds for this work. With but two dissenting, all who own property on Main street have agreed to bear their pro rata of the cost of macadamizing this thoroughfare. The committee is now in correspondence with non-resident owners, and as soon as favorable replies are received this branch of the work will be settled.

**Green Bay, Wis.**—Bids will be asked in the latter part of April for paving Broadway, Madison, Main and Pleasant, South Monroe and West Mason streets, with asphalt, 57,017 square yards, and for macadamizing Webster avenue and North Broadway, 8,741 square yards.—W. W. Reed, City Engineer.

**La Crosse, Wis.**—The Board of Public Works has directed plans and estimates to be prepared for improving certain streets with brick and macadam; the contracts will be let so as to commence work June 1.—Address City Clerk.

## SEWERAGE

**Birmingham, Ala.**—Arrangements are being made to vote on the question of issuing \$500,000 bonds for building sanitary and storm sewers.

City Engineer Julian Kendrick has been directed to prepare estimates for sewers in the north and south sides of the city.

**Elyton, Ala.**—The question of a sewerage system will be taken up in a very short while by the Board of Aldermen.—Frank Smith, Mayor.

**Little Rock, Ark.**—Installation of sewers for new district in northern part of city is advocated.

**Golden, Col.**—Council has arranged for bond issue for constructing sewers; estimated cost, \$23,162.

**Leadville, Col.**—Council is taking steps for securing sewer system. Local sewers are owned by private company, and it is proposed to purchase these or to build new ones.

**Rome, Ga.**—Extensions will be made to the sewer system.—J. N. Hazlehurst, Atlanta, C.E.

**Danville, Ill.**—W. H. Martin, City Engineer, is preparing plans for an 18-inch tile sewer 15,000 feet long in East Danville, for the Board of Local Improvements; estimated cost, \$40,000.

**Freeport, Ill.**—City proposes to build Third Ward sewer system this year; City Engineer's estimate of cost is as follows: 5,540 lineal feet 24-inch sewer pipe at \$2.80 per foot, \$15,512; 1,400 lineal feet 18-inch sewer pipe at \$2.40 per foot, \$3,360; 4,900 lineal feet 12-inch sewer pipe at \$1.70 per foot, \$8,347; 20,790 lineal feet 8-inch sewer pipe at \$1.30 per foot, \$27,027; 103 manholes at \$22 each, \$2,266; labor for inspection, etc., \$1,000; cost of making, collecting assessments, etc., \$2,200; total, \$59,706.

**Moline, Ill.**—Clark G. Anderson, City Engi-



neer, has prepared estimates for 28,000 feet of sewers to be constructed this summer.

**East St. Louis, Ill.**—City Engineer Wm. J. Crocker is preparing plans for a vitrified pipe sewer system for the city.

**Hoopeston, Ill.**—C. E. Cottingham, Consulting Engineer, Danville, is preparing plans for a brick and tile sanitary sewer for this city; estimated cost, \$100,000.

**Quincy, Ill.**—City Engineer is to prepare plans for sewer system for south part of city.

**Joliet, Ill.**—The Board of Local Improvements will probably order construction of sewers in Bridge street and Broadway, at an estimated cost of \$12,241.

**Galva, Ill.**—Council has passed ordinance appropriating \$100,000 for constructing sewers.

**La Harpe, Ill.**—The Board of Local Improvements is to have six blocks of pipe sewer laid, at an estimated cost of \$5,652.

**Silvis, Ill.**—Sewers and water works, to cost \$50,000, are to be installed by this village.—H. G. Paddock, Moline, Ill., Engineer.

**Taylorville, Ill.**—Engineer J. W. Dappert is preparing plans for a sewer for the Board of Local Improvements; there will be 1½ miles of 14-foot main sewers, with 2 miles of laterals; average cuts, 16 feet.—A. J. Kinney, President.

**Mount Vernon, Ind.**—City is reported to be considering installing sewer system.

**Linton, Ind.**—J. H. Green & Sons, Appleton, Wis., have been awarded the contract, at \$60,000, for the construction of sewers for Linton.

**Muncie, Ind.**—The Board of Public Works will soon ask for bids for the construction of a large sewer in West Jackson street.

**Louisville, Ky.**—J. B. F. Breed, Engineer, Sewer Commission, has practically completed plans for sections A and C of the Southern outfall sewer, and bids will probably be asked before April 15. Section A, on the river section, will be 2,100 feet in length, and will extend from Paddy's Run west to the Ohio River, where it will empty. Section C, which will be 4,300 feet in length, will extend from Thirty-second and Woodland avenue to Thirty-second and Stratton avenue.

**Lake Charles, La.**—Council has adopted plans for sewerage system.—Address City Clerk.

**Easton, Md.**—The Sewerage Commission, Gen. Joseph B. Seth, Chairman, has approved the plans of Williams, Proctor & Potts, Engineers, 17 Battery place, New York, N. Y., for sewer system for this place; estimated cost, about \$36,366.

**Detroit, Mich.**—Robt. H. McCormick, City Engineer, has prepared plans for a trunk sewer on Jefferson avenue, from the water works to the Country Club; estimated cost, \$273,500; two pumping stations will be required, with capacity of 250 cubic feet per second.

**St. Paul, Minn.**—The Board of Public Works, R. L. Gorman, Clerk, will soon ask for bids for the construction of a gravity sewer system in Portland and Aldine streets, for which plans have just been completed; estimated cost, \$132,000.—L. W. Rundlett, City Engineer.

The City Engineering Department is preparing plans for sewer system in the West End of Portland and Selby avenue; estimated cost \$133,000.

**Two Harbors, Minn.**—Plans are being prepared by the Minnesota Engineering Company, Providence Building, Duluth, for the construction of sewers; estimated cost, \$25,000.—P. J. McAlpine, City Clerk.

**Kansas City, Mo.**—The West Side City Council passed an ordinance on February 4 providing for the construction of a sewer from Eighteenth street and Muncie Boulevard to the Kaw River; estimated cost, \$100,000.—E. A. Harper, City Engineer.

**Billings, Mont.**—All bids were rejected for constructing sewers.—J. D. Matheson, City Clerk.

**St. Louis, Mo.**—The Board of Public Improvements has passed an ordinance providing for the construction of a section of the Harlem Creek and other sewers; estimated cost, about \$125,000.

**Holdrege, Neb.**—Bids will be received March 17 for the purchase of \$20,000 5 per cent. sewer bonds.—Nels Nelson, City Clerk.

**Albuquerque, N. M.**—An election will be held in March to decide the question of issuing \$400,000 sewer construction bonds.—Address City Clerk.

**Auburn, N. Y.**—Council has adopted amended specifications for the construction of sewer and sewage disposal plant in the Fourth, Fifth and Sixth wards; an application has been made to the State Commissioner of Health to extend the sewer system in Lansing street.—W. Thomas Wooley, City Engineer.

**Long Island City, L. I., N. Y.**—The Local Board passed a resolution to initiate proceedings for the construction of a sewer, for house sewage only, through Jamaica avenue from the Brooklyn Borough line to Freeman avenue, Richmond Hill, with a temporary

pumping chamber at Freeman avenue; estimated cost, \$72,500.

**Perry, N. Y.**—Knight & Hopkins, C. E., Rome, have made preliminary surveys for extension to the sewerage system.—O. Bolton, Village Clerk.

**Seneca Falls, N. Y.**—Pursuant to a resolution passed by the Board of Trustees the \$49,500 in sewer bonds for the completion of the sewer system has been placed on sale.

**Syracuse, N. Y.**—Council has authorized the construction of a 12-inch pipe sewer in Lock alley, from Division to Catawba street, and a 15-inch pipe sewer in Kirkpatrick street, from North State to North Salina street.

**Waterloo, N. Y.**—A \$94,000 sewerage and garbage disposal plant proposition will be submitted to the taxpayers; H. I. Buttery is in charge of the work of securing plans.

**Wilmington, N. C.**—Bids will be received March 6 for the purchase of \$200,000 4 1-2 per cent. 40-year sewer and water bonds.—J. J. Fowler, City Clerk.

**Ashtabula, O.**—Bids will be advertised for the sewerage and improvement of Cherry street.

**Ashtabula, O.**—City Engineer Lewis A. Amnden has prepared plans for the construction of a sewer in West Prospect and Nathan streets; two sets of plans have been made, one calling for the sewer in the center of the street, the other providing that it be built on the south side of the street; the latter method will avoid tearing up street car tracks; Council will decide on the set of plans to be used.

**Cambridge, O.**—Council has instructed O. M. Hoge, city engineer, to prepare plans for the extension of the South Side sanitary trunk sewer; also plans for a sanitary sewer on Beatty ave.

**Columbus, O.**—Council is considering the construction of sewer in Sturtevant avenue at cost of \$60,000.

**Coshocton, O.**—The B. P. S. has adopted plans for the installation of a new sewage disposal plant, and plans were ordered prepared for the draining of the southern part of the city.

**Eaton, O.**—This town has sold \$125,000 worth of sewer bonds.

**Elmwood Place (P. O. Sta. Cincinnati, O.).**—Village Council will delay starting work on construction of sewer system until legality of \$100,000 bond issue voted last fall is tested.

**Hamilton, O.**—Council has approved a bond issue for the construction of Crawford Run sewer improvement, aggregating \$50,708.10; the work will be pushed through immediately.

**Marion, O.**—A sewage disposal plant is being agitated for the infirmary here.

**Orville, O.**—Bids will be received March 9 for \$58,166 5 per cent. sewerage bonds.—Address City Clerk.

**Afton, Okla.**—The matter of issuing bonds for sewer and water purposes is under consideration.—Address City Clerk.

**Bartlesville, Okla.**—Bartlesville has just sold \$104,000 city bonds to John Nuveen of Chicago, at par. \$50,000 of the bonds are for sewers and \$54,000 for refunding purposes.

**Norman, Okla.**—It was almost unanimously decided to issue \$35,000 of bonds for constructing sewers; bonds are sold; bids for construction will be advertised shortly.—John E. Millar, Mayor.

**Okmulgee, Okla.**—Bonds to the amount of \$67,000 have been sold by the Mayor and Council, the proceeds to be used in building a water works system; the bonds were offered for sale last November, but the financial stringency stopped the proceedings; part of the fund will be used in sewer extensions.

**Sellwood (Portland Post Office), Ore.**—The City Engineer has prepared plans for both a sanitary and a combined sewerage system.

**Beaver, Pa.**—The citizens have voted \$50,000 bonds for sewerage system; the Rochester Coal and Supply Company estimates the cost at \$42,000; George McFall, of Beaver Falls, at \$42,500; J. L. Connor, of Freedom, \$39,500; and Thomas Sweeney & Co., \$40,000; but it is believed lower bids will be received for the work when bids are invited.—James P. Leaf, Borough Engineer.

**Derry, Pa.**—It is proposed to construct a sewerage system in the spring, to cost \$33,000.—J. J. Nell and R. G. Gill, Greensburg, Engineers; J. M. Nicholson, Borough Clerk.

**Franklin, Pa.**—The city has been advised by the State Department of Health that within the next two years plans must be prepared for a reconstructed sewer system; it will not be necessary to carry out the plans for several years.

**Huntingdon, Pa.**—J. Murray Africa, Borough Engineer, has prepared plans for sewers and sewage disposal plant for this place; estimated cost, \$80,000.

**New Castle, Pa.**—Council has decided to extend the Fifth Ward storm sewer, and for this purpose has appropriated the sum of \$25,000; bids will be asked in the spring.—C. H. Mulholland, City Engineer.

**New Cumberland, Pa.**—A sewer system may be built; plans by F. H. Shaw, C.E., Lancaster.

**Beaumont, Tex.**—Election will be held March 21 to vote on issuance of \$95,000 bonds for drainage purposes.

**Delhart, Tex.**—The citizens have voted \$75,000 sewer bonds.

**Mount Vernon, Wash.**—City has engaged Dunn & Dunn, Alaska Building, Seattle, to plan a sewer system for this city. A part of the system will be gravity, but some portion will need pumping machinery; plans will be ready for final estimates in about five weeks.

**Cudahy, Wis.**—About \$25,000 is to be spent this year for sewer extensions.—A. C. Sidler, Mayor.

**Jefferson, Wis.**—The Board of Public Works has appointed Engineer E. B. Parsons, Watertown, to prepare plans for four sewerage districts.—J. W. Puerner, Chairman.

**Marinette, Wis.**—L. B. Hillis, City Engineer, is preparing plans for the construction of a sewer on Sherman avenue, from Minneapolis to Shields streets, and on Josephine street, from Lewis street to Sherman avenue.

## WATER SUPPLY

**Elyton, Ala.**—The Water Works Company has had the question of a franchise on all the streets and avenues up with the Board of Aldermen since January 1, application being made for a 35-year grant. In return, the company has offered to install seven plugs free of charge at the present time; the Board has declined the offer.—Frank Smith, Mayor.

**Little Rock, Ark.**—The Home Water Company is planning to extend its system over the Lasker addition or Military Heights.

**Canon City, Col.**—Council has authorized an issue of \$220,000 bonds to pay for water works system.—Address City Clerk.

**Kremmling, Col.**—Plans for a reservoir on Blue River, 15 miles above Kremmling, to cost \$750,000, have been filed in the State Engineer's office at Denver, by D. A. Lorl and M. C. Smith, New York capitalists.

**Monterey, Cal.**—Frank H. Powers, Carmel, proposes to install water works.

**Florida, Fla.**—City has voted \$30,000 bond issue for erection of water works.

**New Britain, Conn.**—Council has passed a resolution authorizing the issue of \$300,000 water bonds for pipe extensions, etc.—Water Commissioner Humphrey.

**Wilmington, Del.**—The Wake Water Company will construct water system for the Agriculture and Mechanical College; estimated cost, \$10,000.

**Commerce, Ga.**—J. B. McCrary & Co., of Atlanta, have the contract to construct water system, at a cost of \$36,000.

**Rome, Ga.**—The city has issued \$150,000 bonds for extensions to water works, sewers and for paving; plans and specifications have been prepared by Engineer J. N. Hazlehurst, Atlanta.—J. R. Cantrell, City Clerk.

**Waycross, Ga.**—The City Water Works Commission has been asked by the new Waycross Cypress Company to extend the water mains to its mill and factory site west of the city.

**Moline, Ill.**—City Engineer Clark G. Anderson has prepared estimates for 14,000 feet of water mains, which will be laid this summer.

**Rockton, Ill.**—South Beloit Water, Gas and Electric Company, of Rockton, has been incorporated, with \$10,000 capital, by W. H. Carpenter, W. G. McCarthy and others.

**Joliet, Ill.**—The Board of Local Improvements is to construct water main in Division street, at estimated cost of \$4,000.

**Salem, Ill.**—The city is arranging to install water works.

**Warsaw, Ill.**—It is proposed to construct a water works, to cost about \$10,000.—Jesse M. Eckhorn, City Engineer.

**Winchester, Ill.**—Council has ordered specifications prepared for water system, estimated to cost \$30,000.

**Morocco, Ind.**—Election will be held to vote on installing water works, to cost \$15,000.

**Charlotte, Ia.**—Estimates are being prepared for water supply.—Address City Clerk.

**Council Bluffs, Ia.**—City Engineer S. L. Etnyre is preparing plans for a system of water works, to cost \$650,000.—W. F. Sapp, City Clerk.

**Fenton, Ia.**—Council has directed estimates to be secured for establishing water system.—Address City Clerk.

**Wapello, Ia.**—Special election may be held to vote on issuing bonds for water works.

**Webster City, Ia.**—Council has directed City Engineer Mullins to procure the cost of constructing four additional wells for water supply.—Address City Clerk.

**Carrollton, Ky.**—The city is arranging to issue \$20,000 light and water bonds, authorized by election in November.—Wm. F. Schuerman, Mayor.

**Evansville, Ind.**—Council has decided to have a filtration plant constructed; bids will be asked as soon as plans are completed.

**Hyattsville, Md.**—Council ordered that bids be invited for installing water meters in the

town; 300 meters have been purchased for use on private service pipes.

The Water Committee was instructed to secure bids for painting the water tank and certain painting and repairing at the pumping station.—Councilman John Fainter.

**Aurora, Minn.**—The village is to expend \$5,000 for extension of its water system.

**Frazee, Minn.**—Council is preparing to establish water supply.—Address City Clerk.

**Alba, Mo.**—The city has voted \$12,000 bonds for building water works.

**Deshler, Neb.**—Bids will be let at once for construction of \$15,000 water system.—Address City Clerk.

**Oswego, N. Y.**—The citizens will vote, March 11, on issue of \$270,000 bonds for the purpose of obtaining water from Lake Ontario.

**Rochester, N. Y.**—Secretary Pifer, of the Board of Contract and Supply, has been directed to advertise for cast-iron boxes and jackets for stop valves, Mathews fire hydrants and stop-gate stones.

**Charlotte, N. C.**—A \$30,000 appropriation has been made to the Board of Water Commissioners for laying larger water mains.

**Minot, N. D.**—Council is considering granting franchise for installing water works; population is about 6,500.

**Belleville, O.**—The citizens of West Liberty are contemplating the building of a reservoir on Glover Hill, the fall to be 165 feet.

**Cleveland, O.**—Council has appropriated \$65,000 to buy six acres of land adjoining the West Side pumping station, to be held as a site for a filtration plant when the present water supply, drawn from the East Side intake, becomes insufficient. The old West Side intake has been abandoned temporarily because of impurities in its supply. To use it a purification plant is necessary.

The Granny Con Water Company, of this city, has been incorporated, with a capital stock of \$75,000, by Edward Merchant, Thomas L. Adams, A. Bruce Carnes and others.

**Columbus, O.**—Council has passed \$75,000 bond ordinance for construction of new downtown water main.

**Defiance, O.**—Council has passed an ordinance for the issue of \$61,500 water works bonds.

**Dresden, O.**—Council has decided to call a special election to vote on issue of \$25,000 bonds, as result of report of committee, which, with Attorney S. B. Darner, of Zanesville, visited a number of cities; it is proposed to install a reservoir system, with the necessary pumping station, etc.; estimates, etc., will be compiled by a committee consisting of A. A. Garver, H. W. Moler and Charles Stevenson.

**Montpelier, O.**—An election will be held, March 16, to decide the question of issuing \$30,000 bonds for improving the light and water system.—Address City Clerk.

**Newton Falls, O.**—R. W. Pratt, State Engineer, is inspecting plans for new water works plant at this place.

**Warren, O.**—Estimates are to be prepared for municipal water works.

**Cleo, Okla.**—Bonds, \$25,000, have been voted for water system.—Address City Clerk.

**Edmond, Okla.**—The city will vote at spring election on a proposition of issuing bonds to the amount of \$35,000 for the purpose of building a municipal water works plant.

**Norman, Okla.**—It was almost unanimously decided to issue \$45,000 of bonds for constructing water works; bonds are sold; bids for construction will be advertised soon.—John E. Millar, Mayor.

**Tulsa, Okla.**—The Water Supply Company is having plans prepared for installing a filter system, estimates to cost \$30,000; contracts will soon be awarded.—Address Secretary of the Water Company.

**Barnesboro, Pa.**—The citizens have voted \$17,000 bonds for a water system for the borough; proceedings have also been instituted in Court to secure an annulment of the borough's agreement with the local water company, on account of failure to supply a pressure sufficient for fire service.

**Beaver, Pa.**—It is intended to expend about \$10,000 or whatever remains from sale of \$50,000 sewerage bonds, recently voted, for making permanent improvements to the water works system.—James P. Leaf, Borough Engineer.

**Chestertown, Pa.**—Council has under consideration an issue of \$50,000 bonds for water works purposes.—Address City Clerk.

**Pittsburg, Pa.**—Plans are to be made for enlargement of city filter plant.

**Sharon, Pa.**—The Sharon Water Works Company will expend \$25,000 for improvements at its plant; a new pump will be installed, giving Sharon a permanent supply; a new 12-inch main will be laid to South Sharon, assuring that town better fire protection.

**West Chester, Pa.**—The Trustees of the West Chester State Normal School propose

to sink artesian wells at the State Institution.—Address Robert Hutchinson, Malvern.

**Clear Lake, S. D.**—Council is considering the matter of securing a better water supply.—Address City Clerk.

**Yankton, S. D.**—The matter of securing a new water supply is under consideration; estimated cost, \$75,000.—Address City Clerk.

**Cisco, Tex.**—Bids are now being received for the purchase of \$16,000 5 per cent. water works extension bonds, payable in 40 years, but redeemable after 30 years.—G. D. Ward, City Clerk.

**Royce, Tex.**—Specifications are being prepared for constructing water system, for which \$15,000 bonds have been voted.—Address City Clerk.

**Bastrop, Tex.**—The local water and light plant has been purchased by William Bayne, Fort Worth.

**Marysville, Utah.**—The State Board of Land Commissioners, Capitol, Salt Lake City, are considering applications for the building of the proposed outlet tunnel of the Piute reservoir, near Marysville; the entire work, including tunnel and canal, will cost in the neighborhood of \$250,000 when completed, and will irrigate a tract of land of 20,000 acres in San Pete and Sevier Counties.

**Newport, Va.**—The city is to ask State Legislature for permission to issue \$1,000,000 of bonds for the purchasing water rights with a view to the erection and maintenance of a water plant.

**Blacksburg, Va.**—Virginia Polytechnic Institute will erect standpipe with which pipes can be connected for supplying water to dwellings and stores in Blacksburg.—Address President Barringer of the Institute.

**Barbourville, W. Va.**—Council has authorized an issue of \$15,000 water works bonds.—Address City Clerk.

**Elm Grove, W. Va.**—The water works are to be improved greatly within the next few months; new machinery costing \$5,000 is to be installed and all old machinery is to be overhauled and put in first-class condition. The water works were formerly owned by the Suburban Water Works but now by the City & Elm Grove Railway Company.

**Winnipeg, Man., Can.**—The City Engineer has petitioned for a second pump with a capacity of 2,000,000 gallons to be installed at well No. 5; estimated cost \$12,000.—H. N. Ruttan, City Engineer.

**Victoria, B. C.**—A. L. Adams, San Francisco, Cal., has been instructed to prepare plans for a water works system on Smith's Hill, and a general distribution system.

## LIGHTING AND ELECTRICITY

**Gridley, Cal.**—The electric light and power plant has been purchased by R. F. Beebe who is planning to make extensive improvements.

**Dublin, Ga.**—Council proposes to improve the electric lighting plant.—Address City Clerk.

**Milledgeville, Ga.**—Oconee River Mills will develop water power at their mills for electric current; they have asked the city for a franchise for a general electric and lighting business.

**Chicago, Ill.**—Council has decided to extend the street lighting system and will install 5,500 additional street lamps. Electrical energy for supplying the additional lamps will be secured from the Sanitary District of Chicago.—William Carroll, City Electrician.

**Moline, Ill.**—The United Light and Power Company has been incorporated with \$60,000 capital by W. H. and David Downing and E. Burke.

**Peoria, Ill.**—Theo. Kipp, Jr., is preparing plans and specifications for installing an electric light system at county farm.—Address County Auditor.

**Elkhart, Ind.**—The School Board is in the market for electrical equipment fixtures, etc., for the Central School building now about completed.

**Hampton, Ia.**—An election will be held March 9 to decide the question of issuing \$12,000 electric light bonds.—Address City Clerk.

**Hartley, Ia.**—An election will be held March 9 to decide the question of issuing \$12,000 electric light bonds.—Address City Clerk.

**Union, Ia.**—A company is being organized to furnish electric light for Union and Whitten.

**Louisville, Ky.**—The Louisville Lighting Co. has decided to expend about \$1,500,000 for improvements.—A. M. Worthington, Manager.

**Mayfield, Ky.**—The Mayfield Water & Light Co., Mayfield, is arranging to rebuild its electric lighting system and will lay about six miles of cast iron water mains.

**Hyattsville, Md.**—The Washington Springs & Gretha Electric Ry. Co. will erect power house at Beverly.—B. J. Stephens, Hyattsville, President; Chas. D. Eldridge, Myersville, Engineer.

**Boston, Mass.**—Architect Adolph Martin has completed plans for a two-story acety-

lene gas plant for the Old Colony Light Company; cost, \$10,000.

**Monroe, Mich.**—The matter of issuing \$50,000 in bonds for improving the light plant is under consideration.—Address City Clerk.

**Baudette, Minn.**—The Village Council has decided to put in an electric light plant in connection with the fire pumping station and has already advertised for bids for installing plant; the specifications call for a 35-kilowatt direct current generator, with switchboard and all other necessary adjuncts to be set up at the power house and wired for use; bids are also asked on copper wire.

**Eveleth, Minn.**—A committee has been appointed by Council to investigate and report upon the advisability of installing an electric light plant; no definite plans have been developed.

**Erskine, Minn.**—A local company is being organized to install lighting plant.—Address L. F. Benson.

**St. Paul, Minn.**—Plans and specifications have been submitted to the Board of Public Works for two sewers to cost \$30,000 by A. R. Sharkey, Assistant Commissioner.

**Waynesboro, Miss.**—The town wants the services of an engineer to make plans and specifications for a concrete dam; also for electric light machinery, wiring, etc.

**Charleston, Miss.**—Arrangements are being made to establish an electric light plant.—Address W. C. Myers.

**Helena, Mont.**—The Helena Power Transmission Company will expend \$1,600,000 constructing third dam across the Missouri river.

**North Platte, Neb.**—The North Platte Electric Light & Power Company will call for bids about July 1 for improvements, to cost \$15,000.

**Pender, Neb.**—H. O. Woodruff, Manager of the Electrical Supply Company, representing Sioux City creditors of the electric plant at Pender, Neb., has purchased the plant and it is in operation again after a week's idleness; the plant will be enlarged.

**Trenton, N. J.**—The Legislature has passed Assemblyman Potter's bill making an appropriation of \$20,000 for a new power and lighting plant at the Soldiers' Home, Vineland.

**Buffalo, N. Y.**—The Council has been petitioned for an appropriation of \$500,000 for beginning the construction of a conduit system for distributing electric light and power for municipal purposes.—Address Frank C. Perkins.

**Franklin, N. Y.**—The Delaware & Otsego Light & Power Company contemplates extending its transmission lines to neighboring towns to furnish electricity for lamps as soon as its dam and power house are complete.—E. A. Markey, President.

**Valley City, N. D.**—Geo. F. Carpenter of Crookston, Minn., will install a gas plant here.

**Carthage, O.**—The construction of a new electric lighting plant is being considered by Council.—Address City Clerk.

**Montpelier, O.**—An election will be held March 16 to decide the question of issuing \$30,000 bonds for improving the water and light plant.

**Roseville, O.**—The directors of the Devonshire Brick & Ceramic Company have decided to erect an electric lighting plant in this town at a cost of \$60,000.—W. A. Shoemaker, Secretary and Manager.

**Newville, Pa.**—An electric light plant which will furnish current for the lighting of the streets by electricity is to be located along the mountain near Roxbury. John Hosfield, electrician, of Shippensburg, has received the contract from Council.

**Hill City, S. D.**—The Hill City Electric Power & Mining Company will install an electric light and power plant.

**Yorktown, Tex.**—Koenig & Son have recently sold their ice and light plant here to a stock company for the sum of \$20,000; the shareholders are H. J. Metch of Cibola, M. A. Krueger and others; extensive improvements will be made.

**Ogden, Utah.**—The business men propose to organize a co-operative lighting plant to furnish illumination for the business houses.—Address G. M. Browning.

**Richmond, Va.**—Acting under a resolution of Council, the Joint Committee on Water and Electricity has appointed a special committee to secure plans and specifications for a new lighting plant at the old Pump House, with a view to ascertaining the cost; the sum of \$6,000 is available for the purpose; the special committee consists of Aldermen Mann, Satterfield and Dabney and City Engineer C. E. Bolling.

**Huntington, W. Va.**—A franchise has been granted to H. H. Hughes for commercial lighting plant.

**Cashton, Wis.**—The voters have decided favorably upon the proposition to establish a municipal lighting plant to cost \$15,000; a bond issue will be passed and work commenced this spring.

**Fond Du Lac, Wis.**—The Briggs Electric Company has been incorporated with \$15,000



capital by W. F. Briggs, Robert T. Mellan and others.

**Sheboygan Falls, Wis.**—The Village Trustees will let contracts, March 16, for franchise for the establishment, maintenance and operation of an electric light plant and system, according to specifications.—Address President and Trustees.

## FIRE EQUIPMENT

**Augusta, Ga.**—Council has under consideration the purchase of a new fire engine.—Address Mayor Dunlap.

**Albion, Ill.**—Council has voted to issue \$2,400 in bonds for the purchase of fire engine.—Address City Clerk.

**Evansville, Ind.**—Architect Harris has prepared plans for a brick and stone hose house, 78.8 by 22 feet, and 33 feet high, with bell tower, with sitting room, ballroom, etc.—Address Board of Safety.

**Louisville, Ky.**—Fire Chief Filmore Tyson recommends the purchase of more fire engines and additional fire apparatus, estimated cost of improvements, \$50,000 to \$150,000.

**Petoskey, Mich.**—Council is preparing to purchase 1,000 feet of hose.—Address Mayor Reyecraft.

**Ely, Minn.**—Council has been petitioned for an appropriation of \$10,000 for building fire hall and for the purchase of fire apparatus.—Address City Clerk.

**Hartland, Minn.**—The fire company is preparing to purchase uniforms.—Address City Recorder.

**Kerkhoven, Minn.**—The Fire Department has petitioned for a fire engine.—Address City Clerk.

**Pipestone, Minn.**—Council will purchase twelve rubber coats for Fire Department.—Address City Clerk.

**Porter, Minn.**—The Fire Department has petitioned for the purchase of fire engine.—Address City Clerk.

**Wilmar, Minn.**—Council proposes to purchase helmets and coats for Fire Department.—Address City Clerk.

**Edinburg, N. D.**—Council proposes to purchase additional fire equipment.—Address City Clerk.

**Petersburg, N. D.**—The matter of improved fire protection is being agitated.—Address City Clerk.

**Sharon, N. D.**—Council is arranging to purchase fire apparatus.—Address City Clerk.

**Spearsfish, N. D.**—Arrangements are being made to purchase fire apparatus.—Address City Clerk.

**Rensselaer, N. Y.**—Council has purchased a site in upper Rensselaer for erecting fire house.—Address City Clerk.

**Akron, O.**—Council has authorized issue of \$15,000 for purchasing site and erecting fire station; an equal sum will probably be expended to purchase two hose carts, hook and ladder truck, etc.—John F. Mertz, Chief, Fire Department.

**Columbus, O.**—Fire Chief Lauer urges the construction of a \$70,000 engine house in the wholesale district; new engine houses are also needed in the First and Second wards according to the members of the Board of Public Safety.—Mayor Bond.

**Zanesville, O.**—Bonds, \$9,000, have been authorized for the erection of a fire station on Forest avenue.

**Scottdale, Pa.**—The Burgers and Fire and Water Committee have been given power to establish a part of the Gamewell fire alarm system in the borough at once to give proper facilities for an alarm of fire.—J. B. Hogg, City Engineer.

**Turton, S. D.**—Council proposes to purchase additional hose.—Address City Clerk.

**Bay City, Tex.**—Council will purchase hose cart and organize fire company.—Address City Clerk.

**Temple, Tex.**—A new fire company is being organized.—Address City Clerk.

**Oostburg, Wis.**—Council proposes to improve fire protection of village.—Address City Clerk.

## PUBLIC BUILDINGS

**Auburn, Ala.**—N. C. Curtis, Professor of Architecture, has made plans for a \$60,000 agricultural building for the Alabama Polytechnic Institute.—Charles C. Thatch, President; W. F. Feagin, Secretary, Building Committee.

**Elyton, Ala.**—The city is to have a \$75,000 school bond issue election on March 23; it is believed the election will be practically unanimous.—Frank Smith, Mayor.

**Berkeley, Cal.**—The Board of Education will call a bond election for \$250,000; of this \$200,000 will go to the grammar and primary schools and \$50,000 to the new Polytechnic high school.

**Longbeach, Cal.**—Architect Franklin P. Burnham, Los Angeles, has made plans for a library building, at Longbeach; cost, \$30,000.

**Napa, Cal.**—The matter of issuing \$30,000 bonds for City Hall is under consideration.—H. J. Thompson, City Clerk.

**Augusta, Ga.**—Architect Lewis F. Goodrich has submitted sketches for the proposed City Hall, which will cost about \$150,000.—Wm. L. Martin, Secretary Committee.

**Collinsville, Ill.**—Architect J. W. Kennedy, East St. Louis, is preparing plans for a 21-2-story, \$30,000 township high school building for the Board of Education.—C. H. Dorriif, Secretary, Collinsville.

**Coulterville, Ill.**—The Board of Education, Mr. Eyre, President, is having plans prepared for a 21-2-story school building, 75x118 feet; brick and Bedford stone, architectural iron and steel, copper cornice, plate glass, metal lath, hard plaster, slate roof, corner beads, coal chute, door hangers, electric fixtures, steam heat, water closets, lavatories, and ventilators; cost, \$30,000.

**Genoa, Ill.**—Architect W. W. Abell, Home Bank building, Elgin, is preparing plans for a brick school building, at Genoa Junction, for the Board of Education; cost, \$20,000.

**Gary, Ind.**—The Board of Education has had plans made by Architect Wm. B. Itner, St. Louis, Mo., for a school building, to cost \$180,000.

**Hickman, Ky.**—Contract was not let for the erection of a \$10,000 library building, according to plans prepared by Architects Whitfield & King, New York City.—S. K. Davidson, Secretary Board of Education.

**Baltimore, Md.**—Architect J. Appleton Wilson, Law building, has completed plans and is receiving estimates for a two-story patrol station, 25x75 feet, at Gold and Bloom streets, for the Board of Fire Underwriters, 8 South street; brick, tin roof, ornamental iron work, electric wiring, water closets, lavatories, bath tubs and steam heat; cost, about \$25,000.

**Atchison, Kan.**—Saylor & Seddon, Kansas City, are preparing plans for a high school building for the Board of Education, care of H. H. Hackney, Atchison, which will cost \$75,000.

**Hyattsville, Md.**—The bill recently introduced in the Legislature by Speaker J. Enos Ray of Prince George County, authorizing the Commissioners of Prince George County to issue bonds in the sum of \$8,000 for the erection of a public schoolhouse at Brentwood, will become a law, and it is expected the new building will be ready for occupancy when the September term of school opens next fall. The bill names the following building committee to have charge of the erection of the structure: R. A. Van Horn, Arthur R. Smith, John Miller, Wallace A. Bartlett, Dr. Harry Nalley, Isaac D. Arnold, Fred E. Weber, Charles M. Newman, Thomas C. Ellicott and Richard P. Riddick, and apply the proceeds toward the erection of the new building.

**Elmira, Mich.**—Architect J. Frederickson, Gaylord, is preparing plans for rebuilding school building; it will probably be of brick, containing five or six rooms.—F. J. Staffor, Director.

**Muskegon, Mich.**—Timothy Cremer, Superintendent of Grounds and Buildings, has plans and will ask for bids for erecting an addition to the high school building.

**Kansas City, Mo.**—Architect S. E. Edwards has prepared plans for a two-story public bath house, to cost \$26,000.—Gus. Pearson, City Comptroller.

**St. Louis, Mo.**—Bids will be received March 20 for \$1,000,000 bonds issued for the construction of insane asylum.—Address City Comptroller Player.

**Omaha, Neb.**—Douglas County will soon hold an election to vote on the question of issuing bonds for a new Court House, to cost \$100,000.—J. M. Haverly, County Clerk.

**Seward, Neb.**—This city contemplates the erection of City Hall and fire station, to cost \$10,000.—Address City Clerk.

**Jersey City, N. J.**—All bids for the extensive repairs to the Coles street bath house have been rejected and new bids will be advertised for; in the meantime some absolutely necessary repairs will be made by J. M. Brown at a cost of \$159; the further repairs will cost about \$2,000.

**Tuckahoe, N. J.**—Architect C. S. Adams, Philadelphia, will prepare plans for a two-story school building for the School Board.

**Rochester, N. Y.**—The Board of Contract has instructed Secretary Pifer to advertise for 3,500 portable sittings in groups of four for the new convention hall at the old armory and to get bids for new fire hydrants, a police patrol battery and other supplies.

**Newark, N. J.**—The Market Committee of Council has instructed Jeremiah O'Rourke of Jeremiah O'Rourke & Sons, Architects, 756 Broad street, to prepare plans and specifications for an extension to Centre Market; the proposed extension will be 120 feet long, extending along the Mulberry street line from the present building to Commerce street, and will accommodate 14 stalls, seven on a side, with a centre aisle.

**Brooklyn, N. Y.**—Architects Geo. B. Post & Son, 347 Fifth avenue, have completed preliminary plans for a steel and concrete ferry terminal, at Thirty-ninth street, Borough of Brooklyn, for the department of docks and ferries; \$200,000.

**New York, N. Y.**—Architect Alexander Stevens, 157-9 East Sixty-seventh street, has prepared plans for a three-story fire engine house, at Bailey avenue and Albany road, Kingsbridge, for the fire department, 157-9 East Sixty-seventh street. Brick and limestone, architectural and structural iron, water closets and lavatories. \$75,000.

**Syracuse, N. Y.**—Architects Gaggin and Gaggin have submitted final plans and specifications for \$60,000 engine house for Company No. 6, and the Watertower Company; it will be 61x97 feet, three stories high, with exterior of red brick, sandstone trimmings and white mortar joints.

The State Board of Charities has approved of plans for the new women's dormitory to be built in connection with the Onondaga County Almshouse; plans are being prepared by Architect Archimedes Russell; cost, \$100,000; as soon as the specifications are completed the County Purchasing Agent will advertise for bids; it is expected that the contract can be awarded by April 1.

**Bryson City, N. C.**—Sealed proposals will be received by Martin De Hart, Chairman County Commissioners, for building a Court House for Swain County.—Smith & Carrier, Architects, Asheville.

**Dogden, N. D.**—The plans of Architect J. W. Ross, Grand Forks, were accepted for a two-story, four-room brick school building for school district No. 62, Dogden.—J. G. Overholser, Clerk School Board.

**Akron, O.**—An ordinance authorizing the Board of Public Safety to issue \$35,000 bonds for the purchase of a site and the construction and equipment of a central police station was passed by Council; the ordinance was amended so that the bonds are now dated March 1, instead of April 1, making it possible for the preliminary work to be started a month earlier.

**Cincinnati, O.**—Architect Harry Hake is preparing plans for a \$35,000 two-story police station and patrol house for the Board of Public Safety.

**Conneaut, O.**—Architects Howard, Insko & Merriam, Columbus, are preparing plans for the two-story Carnegie Library building for the Board of Library Trustees, to cost \$40,000.

**East Cleveland, O.**—The citizens have voted to expend \$38,000 in enlarging the Prospect school.—Address Village Trustee.

**Pendleton, Ore.**—A new City Hall will be built from the proceeds of a recent bond issue.—Address the Mayor.

**Norristown, Pa.**—Baker & Dallett, architects, 1639 Chestnut street, Philadelphia, have plans for a three-story nurses' home for the State Asylum for Insane; it will be of brick, stone and steel, and will cost \$50,000; bids will be received in about a month.

**Shamokin, Pa.**—Architects Jury & Kessler are preparing plans for a two-story hospital building for the Shamokin Hospital; brick, stone, steel and terra cotta, fireproofing, slag roof, open plumbing, tile and marble work, plate glass, electric fixtures and steam heat and ventilating systems; cost \$60,000.

**Central Falls, R. I.**—Architects McLean & Wright, Boston, have prepared plans for a library building, at Central Falls; cost \$25,000.

**Amarillo, Tex.**—The citizens have voted \$50,000 bonds for school purposes.—Address Secretary, School Board.

**Canyon City, Tex.**—The Randall County Commissioners have authorized an issue \$50,000 Court House bonds; the bonds will be offered for sale at once.—Address County Auditor.

**Lexington, Tex.**—The citizens have voted \$8,000 bonds for the construction of school house.—Address Clerk, Board of Education.

**Livingston, Tex.**—The plans of Architects J. S. Glover & Son, Houston, have been accepted by the School Board for a brick school building.

**Petersburg, Va.**—Plans are being made for reconstructing jail building.

**Danville, Va.**—Architect J. O. Magruder has prepared plans for enlargement and improvement to jail building, 40x70 feet.

**Green Bay, Wis.**—Plans are being prepared by C. E. Bell, Northwestern Building, Minneapolis, Minn., for a two-story courthouse to be built at Green Bay, to cost \$200,000.

**Juneau, Wis.**—Architect F. L. Lindsay, Webster block, Oshkosh, is preparing plans for a two-story addition, 46x120 feet, and 38x88 feet, to Insane Asylum, for the Dodge County Board, John Bodden, Chairman Building Committee, Horicon; press brick, cut stone trimmings, galvanized iron cornice, ornamental iron, oak finish, maple floors, plate glass, tile work, electric fixtures, lavatories, water closets and bath tubs; cost \$80,000.

**Madison, Wis.**—Architect Arthur Peabody is preparing plans for a concrete building for the department of animal husbandry for the board of regents of the University of Wisconsin; \$75,000.

**Whitehall, Wis.**—Architects Parkinson & Dockendorff, La Crosse, have plans for a City Hall.



## ELECTRIC RAILWAYS

**Paris, Ark.**—The Paris-Subiaco Traction Company was incorporated, with a capital of \$60,000, to build a railroad. D. J. Young, Ft. Smith, Ark.; Conrad Elsen and G. G. Dandridge are among the incorporators.

**Freeport, Ill.**—From Chicago to the Mississippi river by interurban via Elgin, Belvidere, Rockford, Freeport, and Mt. Carroll, will result upon the completion of a projected electric railroad from Savanna, Ill., to Freeport, for which a right-of-way is now being secured by Frank Zinnel, a promoter; eastern capital will take up the stock; the proposed road will be built southwest from Freeport to Savanna, taking in the villages of Florence, Shannon and Lanark, as well as Mount Carroll.

**Graysville, Ill.**—Capitalists from Evansville, Cynthiana, Mt. Carmel, Lancaster, and Olney interested in the building of an electric line from Evansville, Ind., to Olney, Ill., have decided to incorporate the Evansville, Mt. Carmel & Olney Interurban Company, under the laws of Indiana.—Eden Knopp, Olney, President; C. W. Courter, Mt. Carmel, Secretary.

**Litchfield, Ill.**—A syndicate, headed by Prof. E. W. Adams, is securing the right of way for an interurban railway, between Decatur and Litchfield, a distance of 56 miles; Engineer not selected.

**Indianapolis, Ind.**—The Indianapolis & South Bend Traction Company has filed articles of incorporation; capital stock \$10,000; the company proposes to construct and operate street and interurban railways for passengers and freight service.—Edward M. Bowman and Robert H. Keller, Directors.

**Vincennes, Ind.**—The directors of the Vincennes Traction & Light Company have authorized an issue of \$100,000 preferred stock for improvements; the company proposes to make extensive improvements, including an extension to South Vincennes and the doubling of all the tracks in Vincennes; new rolling stock will be purchased and the power plant enlarged.—Geo. R. Henry, General Manager.

**Sioux City, Ia.**—The Sioux City Traction Company has petitioned Council for franchise to extend its tracks on several streets.

**Coffeyville, Kan.**—D. H. Siggins, President of the Traction company of this city, will go to Caney to look over the prospect of building an interurban line from Deering where it would connect with the Coffeyville-Independence line.

**Louisville, Ky.**—The Louisville Traction Company is preparing to extend its line to the new State Fair Grounds.

**Minden, La.**—The Minden Traction Company has been granted a franchise to build and operate an electric railway or a gasoline motor car line.—H. A. Davis, Manager.

**Portland, Me.**—The Hancock & Lake Linden Traction & Power Company has been incorporated in Maine to build traction and power lines; capital \$800,000.—J. E. Manter, President, C. E. Eaton, and others, incorporators.

**Detroit, Mich.**—Council has granted to A. Booth & Company, L. H. Stevens, Jr., Manager, corner Congress and Sixth streets, a franchise to construct, maintain and operate a line of railway to connect their works.

**Perry, N. Y.**—The Village Board has granted a franchise for an electric railroad from Rochester to Perry, Silver Creek and Portage.

**Claremore, Okla.**—George Wytell and Joseph McDermott have been granted a franchise for an electric street railway.

**Christiana, Pa.**—The Conestoga Traction Company was granted a franchise for the construction of a proposed five-mile extension from Christiana to Atglen and Parkersburg.—H. W. Craford, Chief Engineer, Lancaster, Pa.

**Meadville, Pa.**—The Central Crawford Traction Company was organized to build an electric railroad.—Dennis Smith, President; Joseph H. Heard, Secretary and Treasurer.

**Shrewsbury, Pa.**—A company has been organized to build an electric railroad to York, Pa.—David C. Goodling, President, Loganville; C. B. Smith, Vice President, Shrewsbury; John H. Keller, Secretary, Shrewsbury.

**Spartanburg, S. C.**—The Greenville & Spartanburg Electric Railway Company was incorporated, with a capital of \$100,000, to construct an electric railroad. O. K. Mauldin, H. H. Prince and A. A. Gates are among the incorporators.

**Prosser, Wash.**—The directors of the Prosser Traction Company are planning to make many extensions to system; the power plant will be located five miles below Prosser; it is not fully determined where the electric line will cross the Yakima river whether at the power plant or at Prosser or both.

**Fairmont, W. Va.**—At an early date the Fairmont and Clarksburg Traction Company will begin work on extending their line from Grasselli to Bridgeport.

## BRIDGES

**Denver, Col.**—Plans are being prepared by the Board of Public Works for a new bridge to span Cherry Creek at Logan avenue of reinforced concrete and ornamental iron work, to cost about \$40,000; the new bridge will be put in before the new Cherry creek boulevard and wall are constructed.—Address Alderman Cochran.

**Glenwood Springs, Col.**—G. M. Houston, Deputy State Engineer, met with the Commissioners of Garfield County to confer regarding the bids on the proposed State bridge across the Grand River at Silt; the bids were above the appropriation made by the commissioners and new ones will be asked; an effort will be made to have work commenced April 1.

**Chicago, Ill.**—Plans have been prepared by Thomas G. Pihfeldt, City Bridge Engineer, for the construction of a reinforced concrete bridge over the Illinois and Michigan Canal at Western avenue; estimated cost, \$20,000; bids will probably be asked in April.

**East St. Louis, Ill.**—The East St. Louis & Suburban Railway Company will have a bridge constructed over high ground on the east side; the bridge is to be 40 feet wide.

**Paris, Ill.**—The County Board of Supervisors will be petitioned to appropriate half the cost of erecting a bridge over Sugar creek, in the northeast portion of Edgar Township; a 75-foot bridge will be required to span the stream.

**Bluffton, Ind.**—The Cincinnati, Bluffton & Chicago R. R. Co. will have a bridge constructed across the Wabash river near here.—J. C. Curtis, Huntington, Ind., General Manager.

**Goshen, Ind.**—Bids will soon be asked by the Commissioners of Elkhart County for the construction of a bridge over Pine river.—Address County Auditor.

**Barboursville, Ky.**—Knox and Whitley Counties are considering construction of steel bridge across Cumberland river at Tye's Ferry, connecting the two counties; estimated cost \$15,000.—Address Knox County Commissioners.

**Owensboro, Ky.**—Plans have been completed for the bridge across the Ohio which the Owensboro and Rockport Bridge and Terminal Company proposes building and are now in the hands of Geo. H. Cox, Secretary of the company; the surveys were made and the plans and specifications drawn by the Osborne Engineering Company of Cleveland, O.; it is estimated that the bridge can be built for not exceeding \$1,000,000 and that the bridge and railroad line between Owensboro and Rockport will not cost over \$1,250,000.

**Owingsville, Ky.**—Money has been subscribed for constructing a bridge across the Licking river at Farmers' and Salt Lick crossing, Bath County.

**Haverhill, Mass.**—Council will petition legislature for authority to issue \$120,000, 30-year bridge bonds.—Address Mayor Wood.

**Lynn, Mass.**—The citizens have petitioned the State Roads & Bridge Committee for a bridge between the city of Lynn and the town of Saugus.—Address City Clerk.

**St. Joseph, Mich.**—Engineer Pearl has completed plans and specifications for new highway bridge, and will turn them over to the special bridge committee at once; will be advertised for at once and within a month the matter will probably assume definite form.

**Mankato, Minn.**—The residents of North Mankato have petitioned the Nichollet County Board to build second bridge.—Address County Auditor.

**Hawkinsville, N. Y.**—An appropriation has been made by the State to build and maintain a swing bridge across the Black River Canal feeder at Hawkinsville; \$10,000 is appropriated.—Address State Superintendent of Public Works, Albany.

**Le Roy, N. Y.**—C. L. Simkins, Manager Battle Creek Bridge Company, Battle Creek, Mich., has prepared plans for a reinforced concrete bridge at Le Roy; estimated cost \$16,000.

**Durham, N. C.**—Durham County will build six bridges in connection with construction of Roxboro road, one of which will have span of 100 feet, another of 80 feet; and four of 16 feet each; estimated to cost \$6,300.—M. G. Markham, County Clerk.

**Cleveland, O.**—Plans are being prepared for a concrete bridge to be constructed over the Rocky river at Detroit avenue; it will be one of the finest concrete structures in the country, with a width of 64 feet and a cost of \$250,000.—A. B. Lea, County Engineer.

**Hamilton, O.**—An ordinance is before Council providing for an issue of \$50,000 bonds to pay for the arching of Crawfords Run. Interest 5 per cent.

**Zanesville, O.**—The County Commissioners are preparing plans and specifications for a covered wooden bridge which it has been decided to build over Salt creek at what is

known as Burton's Mills; the span is about 100 feet.—Address Muskingum County Auditor.

**Stillwater, Okla.**—The Payne County Board has ordered the Clerk to advertise for steel bridges as follows: 65-foot span over Stillwater creek between sections 11 and 14, township 18, range 3 east, in Clayton township; 30-foot span over Little Stillwater creek between sections 11 and 12, township 18, range 3 east, Clayton township.—Address County Auditor.

**Sulphur, Okla.**—The George Washington bridge across the Rock creek in the Platt National park which was closed two months ago, has been repaired and opened again to the public; an emergency appropriation of \$20,000 has been appropriated by Congress for a new bridge at this point.

**Scranton, Pa.**—The City Engineer will prepare plans for a foot bridge at the Seventh avenue crossing of the Bloomsburg division of the Delaware, Lackawanna & Western R. R.

**Wilkes-Barre, Pa.**—Representatives of the four steam railroads the Wilkes-Barre and Hazleton Electric Road have decided to erect a reinforced concrete bridge over the city streets; it is probable that the bridge will be built during this year.—James MacMartin, Chief Engineer, Delaware & Hudson Co., Albany, N. Y.

**Franklin, Tex.**—The Mumford City Council has petitioned the Robinson County Board to assist in putting a wagon bridge across the Brojor river, three miles from Mumford.

**Palestine, Tex.**—The Railroad Commission has made public its order requiring the International and Great Northern Railroad to make material improvements on its physical property; they will cost over \$1,000,000 and embrace a new roadbed on the main line and on the Columbia and Madisonville branches; new seventy-five-pound steel rails must be put down to be completed in two years, and all wooden bridges and culverts must be replaced with permanent structures of concrete steel and iron.—Leroy Trice, General Manager.

**Ogden, Utah.**—A committee of Council has the matter under advisement of building a bridge at the mouth of the Ogden Canyon.—Address City Clerk.

**Lynchburg, Va.**—Southern Railway, D. W. Lum, Chief Engineer, Washington, D. C., contemplates the construction of three steel bridges at Lynchburg.

**Willcox Wharf, Va.**—The Board of Supervisors of Charles City County will construct a bridge over Chickahominy river; plans are wanted.—J. E. Hubbard, Member of Board.

**Janesville, Wis.**—Council proposes to expend \$40,000 for two new bridges for the year 1908.—Address City Clerk.

## MISCELLANEOUS

**Evansville, Ind.**—Chief of Police Brenneke has submitted specifications for a new patrol wagon according to his ideas and the Board of Safety has decided to have him secure bids for the construction of a wagon after which they will make a selection and award the contract.

**Perth Amboy, N. J.**—City Engineer S. J. Mason is preparing plans for a concrete retaining wall, to be erected on Market street; cost \$6,000; bids will be received in the middle of March.—Wilbur La Roi, City Clerk.

**Schenectady, N. Y.**—An effort is being made by Alderman A. F. Tinnerhold to bring to life the garbage disposal plant matter. He has had a talk with Health Officer Durycce and got his promise to lend his aid to the movement. He has also talked with several Aldermen and all of them would like to have the garbage disposal plant started before the hot weather. Last year an allowance of \$10,000 for the plant was made in the city budget, but owing to the high bids received was not used, and was put in the contingent fund.

**Schenectady, N. Y.**—Mayor Van Voast, Commissioner of Public Works Pond and City Engineer Trumbull will leave and confer in New York with the New York Central office concerning the erection of a new and wider culvert in Villa Road; by agreement one-third of the expense will be borne by the city and the rest equally divided between New York Central Railroad and Schenectady Railway Companies.

**Troy, N. Y.**—General dissatisfaction is expressed over the garbage disposal system now in operation, and a committee consisting of E. L. Grimes, City Engineer, and William H. Shields, Commissioner of Public Works, has been appointed to thoroughly investigate the subject and report their findings to the Board of Contract and Supply.—Elias P. Mann, Mayor; H. W. Gardinier, Comptroller.

**East Liverpool, O.**—The Board of Health will soon advertise for bids for the collection and disposal of nightsoil and garbage until December 31, 1908, with the understanding that each citizen pays for the collection of his garbage up to that time; after that period the Board expects to have decided on a

different arrangement whereby the cost can be equally distributed.

**Toledo, O.**—The proposition to install an incinerating plant in Toledo for the destruction of all sorts of garbage has been presented to the Board of Public Service by E. H. Foster, representing the Power Specialty Company of New York. It is claimed that garbage of all sorts, tin cans, bottles, etc., are burned under a temperature of 1,250 degrees. There are no bi-products, as is the case in the present reduction plant, steam and clinkers being the only things produced by the incinerating system. No action was taken regarding the matter.

**Youngstown, O.**—The Consolidated Gas & Electric Lighting Company will be allowed by Council to place all its wires underground; bonds for the purchase of street flushers, improvements, etc., aggregating \$26,000, were passed.

**Altoona, Pa.**—Members of the Board of Health held a conference with North, Taylor and Fiske, a sub-committee from Councils, on garbage disposal recently, but no definite action was taken; the members informally discussed the question of a crematory, and at the close the Councilmen were given a portion of the mass of crematory data the Health Board has been collecting for years to examine.

**Milwaukee, Wis.**—Rudolph Hering, New York City, has been engaged to prepare plans for a garbage plant for the city.—Chas. J. Poetsch, Chairman Board of Public Works.

### BIDS RECEIVED

**Florida, Ala.**—J. B. McCrary & Company, Atlanta, Ga., have the contract for constructing water works to cost \$20,000.

**Ft. Morgan, Ala.**—The Chicago Bridge & Iron Works, Chicago, has the contract, at \$16,400, for constructing a 150,000-gallon steel tank and trestle, at Ft. Morgan.

**La Fayette, Ga.**—J. B. McCrary & Company, Atlanta, are getting up plans and have the contract for the construction of an electric light plant for Vidalia.—John A. Clement, City Recorder.

**La Fayette, Ga.**—J. B. McCrary & Company, Atlanta, are getting up plans and have the contract for the construction of water works for Vidalia.—John A. Clement, City Recorder.

**Washington, D. C.**—The Commissioners have opened bids for furnishing the District with sewer pipe; the lowest bidders being William W. Clark Sons of Baltimore, who bid 62 cents per foot for 21-inch pipe, 42 cents for 18-inch pipe and 25 cents for 12-inch pipe. The list of bidders included the Patton Clay Manufacturing Company of Patton, Pa.; American Sewer Pipe Company, Pittsburg, Pa.; National Fireproofing Company of Pittsburg, Pa.; Lamond Bros. of Lamond, D. C., and A. M. Porter of Pittsburg.

Bids submitted for installing the sewerage system of the Walter Reed Army General Hospital were opened in the office of Capt. H. L. Pettus of the Quartermaster's Department, who is in charge of construction. F. J. Boas of Philadelphia, for \$7,577, was found to be the lowest bidder. He also presented a supplemental bid that a charge of \$1.70 per cubic yard would be added where stone is found in excavating. Bids were also submitted by Faith & Company of Philadelphia, Dunningan Plumbing Company, Martin McNamara, W. F. Brenizer, McCay Engineering Company, Cranford Paving Company, Urban & Bradley and E. G. Gummel of this city, G. W. Brubaker & Company of Philadelphia, Minor Engineering Company and Pitt Construction Company, of Pittsburg, Pa., Newport Plumbing Company, of Newport News, Va. The amounts ranged from the lowest bid to \$12,400. The lowest bid will be sent to Quartermaster General Aleshire for his approval.

**Cairo, Ill.**—Contract for paving with brick Washington avenue from Second to Thirty-fifth street, 51,646 square yards, was let to Roy L. Williams, Kalamazoo, Mich.—Ernest Nordman, Secretary Board of Local Improvements; W. B. Thistlewood, City Engineer.

**Joliet, Ill.**—The Water Committee has closed a contract with the Economy Light and Power Company, which provides that the company shall furnish the electrical motive power in the new city pumping station in North Ottawa street; the station will be put in operation about May 1, and the contract will be effective until January 1, 1909; at that time a standing contract existing between the city and the Economy Company expires, and a new working agreement will be made; the price to be paid is \$40 per horsepower.—C. A. Munroe, Manager, Power Company.

**Lyons, Ill.**—The Chicago Bridge & Iron Co., One Hundred and Fifteenth and Throop streets, Chicago, have the contract, at \$5,800, for erecting a steel water tower, of 100,000 capacity, for the Board of Trustees of the village.—Adam G. Metz, Village Clerk; Wm. B. Ewing, C. E., Chicago.

**Mt. Vernon, Ill.**—J. T. Collins, Venice, has

been awarded contract for 10,167 square yards brick paving with cushion and sand filler to be put down on a macadam street; curbs and base already in at \$1.10 per square yard; total, \$10,990.75; J. T. Mannen, Mt. Vernon, bid \$12,000.—W. B. Williams, Mayor.

**Peoria, Ill.**—The Board of Local Improvements has awarded contract for paving First avenue from Spencer to Seventh streets, to the Crescent Contracting Company, at \$20,055. Contracts have also been let aggregating a cost of \$100,000. These include the thirteen blocks on First avenue, the paving of Jackson street from Glendale avenue to the river; South Water street from Main to Chestnut; Knoxville avenue from Main to Hamilton, with small strips on Garfield avenue and Kinzie streets. The work on all these streets will be pushed to completion as soon as the frost is out of the ground.

**Paris, Ill.**—The Baum Construction Company of Paris was low bidder on three paving jobs—East Madison street, at \$15,097; East Washington street, \$10,716, and Chestnut street, \$5,697.69. Parrish Brothers, Paris, bid \$15,650.90; \$10,935.18 and \$5,742.85 on the three streets. Troy Porter, of Paris, bid \$16,549.71; \$11,333.28, and \$6,127.66; Coughlin & Sizemore of Paris, \$17,355.56, \$12,264.39 and \$6,463.64, while the Mercantile Bridge & Tile Company bid \$17,704.47 on the East Madison street work and \$6,579.35 on the Chestnut street paving.

The details of the low bid of the Baum Construction Company on the three jobs follow:

East Madison Street—Excavation, 4,163 yds., 19c; resetting curb, 248 ft., 7c; combined curb and gutter, 6,282 ft., 30c; pavement, 9,273 yds., Clinton brick, \$1.215, Terre Haute brick, \$1.22; Brazil brick, \$1.27; filler, 9,273 yds., 8c; inlets, 4, \$10.00; storm drain, 10-inch, 1,000 ft., 20c.; catch basins, 7, \$20; total, \$15,097.47.

East Washington Street—Excavation, 4,133 yds., 22c; resetting curb, 148 ft., 6c; combined curb and gutter, 3,217 ft., 30c; pavement, 6,635 yds., Clinton brick, \$1.22; Terre Haute brick, \$1.225, Brazil brick, \$1.275; filler, 9c; inlets, 3, \$13.00; storm drain, 10-inch, 200 ft., 20c; catch basins, 1, \$22.00; total, \$10,716.09.

Chestnut Street—Excavation, 2,385 yds., 20c; resetting curb, 96 ft., 6c; combined curb and gutter, 2,634 ft., 30½c; pavement, 3,368 ft., Clinton brick, \$1.215, Terre Haute brick, \$1.22, Brazil brick, \$1.23; filler, 8c; inlets, 1, \$10.00; storm drain, 10-inch, 100 ft., 20c; catch basins, 1, \$20.00; total, \$5,697.69.

**Quincy, Ill.**—A. L. Nelson, of Canton, Mo., was awarded the contract for repairing and strengthening portions of the Lima Lake drainage district levee, the price being from 15 and 18 cents a cubic yard.

**Wilmette, Ill.**—The Board of Local Improvements let contract to F. G. Mortimer, Glencoe, for the construction of a relief sewer system, involving some five miles of sewer, both concrete and vitrified tile.—E. P. Dunshie, Superintendent of Public Works; Chas. N. Roberts, Engineer, Reaper Block, Chicago.

**Indianapolis, Ind.**—Contracts for two hose wagons for the fire force were awarded to Joseph W. Buchanan, by the Board of Public Safety, at \$308.50 each, the lowest of three bids, the others being the Berndt Brothers' Company and Peter Berndt & Son.

**Linton, Ind.**—Council has consented to the transfer of the \$65,000 sanitary sewer system from Morgan & Slinkard, original contractors, to the Green & Son's Company, of Chicago, and within ten days the new company promises to begin work. Messrs. Morgan and Slinkard took the contract last October, but, owing to the stringency of the money market, were unable to dispose of the bonds.

**South Bend, Ind.**—A. M. Ozburn, of Chicago, Ill., representing the McWane Pipe Works, Lynchburg, Va., has entered a protest against the award by the Board of Public Works of contract of water pipe to the U. S. Cast Iron Pipe Company, and Council is considering the protest. Ozburn claims his bid was low, he bidding \$23.85 for 6-inch cast-iron pipe and \$23.65 for 8, 10 and 12-inch pipe and 2½ cents per pound for special castings. The U. S. Cast Iron Company bid \$24 per ton for pipe and 2½ cents for castings. The price of castings, providing 17 tons are used, would make the U. S. Cast Iron Company low, but Mr. Ozburn claims this amount is largely in excess of what practical foundry men figure the relative difference in the amount of pipe required in a given mileage. The contracts, which have not as yet been approved by Council, follow:

Not more than 750 tons nor less than 250 tons of water pipe for the season, United States Cast Iron Pipe and Foundry Company, of New York and Chicago, at \$24 per ton and 2½ cents per pound for special castings.

For water meters, Thomson Meter Company, Brooklyn, N. Y., 25 1-inch at \$16.80 each and 50 ½-inch at \$8.40 each; Union Water Meter Company, Wooster, Mass., 50 ½-inch at \$8 each; Pittsburg Meter Company, East Pittsburg, Pa., 50 ½-inch at \$8.40

each; Henry R. Worthington Company, Chicago, 50 ½-inch at \$7.35 each.

For hauling pipe, Martin Pietraszewski, for 50 cents per ton and labor at 50 cents an hour.

Season's supply of fire hydrants: To Mathews Fire Hydrant Company, at \$25.50 each, f.o.b.

For valves: To Roe, Stephens Manufacturing Company, Detroit, Mich., 36 6-inch at \$10.50 each; 12 10-inch at \$22.50 each, f.o.b.

**Council Bluffs, Ia.**—Wickham Brothers have contract for brick paving and cement and stone curbing, at approximately \$100,000.

**Baltimore, Md.**—The Metropolitan Construction Company, which built the big sanitary sewer in the bed of Pratt street, east from Light street, was awarded the contract for constructing the extension of this same sewer down Light street to Hill and west on Hill street to Sharp street. The contract price was \$150,895.15. The company has only recently finished work on the Pratt street sewer, which has just been accepted by the Commission. Other bidders on the work were: the Warren F. Brenzier Company, of Washington; Donovan & Phillips, of Boston; and the McLean Contracting Company, of Boston. This section of the low-level system will be about three-fifths of a mile long; it will be the first sewer constructed by the Sewerage Commission in South Baltimore.

The Maryland Dredging Company has been awarded contract for extending the 24-foot channel from Will street along the northern side of the harbor to Pratt and Light streets, at 30 cents a cubic yard; also for the usual summer dredging in the back basin, Middle branch and lower harbor, at 15 and 17 cents a cubic yard.

The Baltimore Ferro-Concrete Company, 16 St. Paul street, has been awarded the contract, at \$179,516, for the construction of a concrete bridge across Gwynn's Falls, on line of Edmondson avenue; work will be done under supervision of B. T. Fendall, City Engineer.

**Holyoke, Mass.**—Charles Millar & Son Company were low bidders on pipe to be reset during the year, and also being one of the lowest bidders on the fittings, were awarded both contracts by the Water Commissioners. The amount of pipe called for in the contract was 1,000 feet of 6-inch pipe, 1,000 feet of 8-inch pipe, 300 feet of 12-inch pipe and a large amount of special fittings for the same. The bids were as follows: Holyoke Motor Foundry Company, 3½ cents per pound; Warren Foundry Company, pipe, \$25.50 per ton; fittings, 2½ cents per pound; Holyoke Supply Company, pipe \$24.90 per ton; fittings, 2½ cents per pound; United States Cast Iron Company, pipe \$25.20 per ton, fittings 25 cents per pound; Charles Millar & Sons, pipe \$24.70 per ton, fittings 2½ cents per pound; Samuel Snell Company, pipe \$25.50 per ton, fittings 2½ cents per pound; Davis, Farnum Company, pipe \$25.20 per ton, fittings 2½ cents per pound; all fittings are to be shipped f.o.b. Holyoke.—Thomas J. Carmody, Chairman.

**Lynn, Mass.**—The following paving bids are being considered by the Board of Public Works: Boston Asphalt Company, Bermudez asphalt, including five-year guarantee, \$3.10 a square yard. John E. Burns & Co., Roxbury, Mack vitrified brick, \$2.75; if city prepares sub-grade, \$2.45 a yard. Connecticut Hassam Paving Company, New Haven, Hassam concrete, \$1.75 square yard; five-year guarantee. Albert G. Foster, Lynn, Mack Clearfield vitrified brick, \$3.50 a square yard; if city prepares sub-grade and does excavating, \$3.30 a square yard. Hassam Paving Company, Worcester, Mack vitrified brick on Hassam cement concrete, \$2.74 a square yard; wood block on Hassam cement concrete, with five-year guarantee, \$3.70 a square yard. Lynn Granolithic and Construction Company, \$1.60 a square yard, including five-year guarantee. J. H. McLaughlin, Lynn, McLaughlin smooth pavement, \$1.75 a square yard; six-year guarantee. P. J. McDermott, Lynn, Rosendale cement concrete base, city to furnish vitrified bricks, \$1.45 a square yard; with five-year guarantee. David J. Sheehan, Lynn, grouted concrete roadbed, \$1.39 a square yard; Mack vitrified brick, \$2.96 a square yard; if city prepares sub-grade, \$2.71 square yard. Warren Brothers, Boston, bitulithic on bituminous foundation where there are tracks, \$2.30 a square yard; where there are no tracks, \$3.25 a square yard; bitulithic on concrete foundation where there are no tracks, \$2.50 a square yard; where there are tracks, \$2.55 a square yard. Worcester Conduit Company, vitrified brick, grouted, on six feet base sand cushion, \$3.04 a square yard; on four feet base sand cushion, \$2.71 a square yard; on five feet sand base, \$1.97 a square yard.

**Springfield, Mass.**—Bids were opened by the Water Commission and contracts awarded for the iron piping to replace the low service pipe now in use in the distributing system; the contract for the sizes under 24 inches went to Charles Millar & Son Com-



pany, of Utica, N. Y., and for all sizes over 24 inches to the United States Cast Iron Pipe Company, of Philadelphia, the lowest bidders. The contract for the specials is divided between these firms, Millar & Son Company, to make the specials for the sizes of pipe they furnished and the United States Company for the larger sizes. Charles Millar & Son Company's bid on the sizes of 24 inches and under was \$24.20 a ton. The contract calls for 1,345 tons, and the cost will be \$32,549. The United States Company's bid on the sizes over 24 inches was \$24.40 a ton, which will make a total cost of \$3,540.46 for the 146.3 tons required. The bids on the specials varied from 2.45 cents a pound, the figure submitted by Fred A. Houdlette & Sons, to 2.75 cents a pound, bid by R. D. Wood & Co. Most of the bids were 2½ cents, and it was decided to let the contracts for the specials at that figure to the two firms making the pipe, in order to secure the greatest degree of uniformity in the fittings. Seventy tons of specials will be required, which will figure up a total of \$3,500 at the contract price.

**Waltham, Mass.**—The Lynchburg Foundry Company, Lynchburg, Va., was low bidder for furnishing the water Department with service pipe, at \$25.35 per ton for 4 and 6-inch pipe.

**Berrien Springs, Mich.**—The C. L. Olds Construction Company, Ft. Wayne, Ind., was awarded the contract, at \$14,853.50, for the construction of a water works system.—Loren B. Marquisee, Village Clerk; A. J. Hammond, Engineer, South Bend, Ind.

**Cadillac, Mich.**—The Board of Public Works has awarded contract to the Central Bitulithic Company, at \$2.15 per square yard, for paving several streets.

**Detroit, Mich.**—The Board of Water Commissioners have awarded contract for 2,650 tons water pipe to the American Car and Foundry Company, at \$23.74 per ton, and for special castings to the same firm at \$2.75 per 100 pounds.—Robert H. McCormick, City Engineer.

**East Lansing, Mich.**—The following bids were received for the erection of an agricultural building at Michigan Agricultural College, exclusive of heating, lighting and plumbing: H. G. Christman Company, \$152,638; Early, Fitzpatrick & Nichols, \$154,703.65; George F. Germain, \$158,224; E. W. Reid & Son, \$159,577.44; Hagameir & Scully, \$161,715.66; Chittenden & Skinner, \$162,393.89; A. J. Smith, \$163,000; Charles Hoertz & Son, \$175,389; H. V. Snyder & Son, \$187,900; Standard Construction Company, \$189,800.—A. M. Brown, Secretary.

**Duluth, Minn.**—Because the check he filed with his bid was not 10 per cent. of the bid, as required by the charter, the Board of Public Works has decided that Jacob Jacobson should not receive the contract for the West End police station, and the contract was awarded to Emil Zauft, subject to the approval of Council. Jacobson's bid was \$7,195, and Zauft's \$7,199; the check filed by Jacobson was only \$200, while Zauft filed one for \$800; the Board decided that, as there was but \$4 difference in the bids, and Zauft had complied with all conditions, while Jacobson had not, the West Duluth man should get the contract.

**Minneapolis, Minn.**—The U. S. Cast Iron Pipe and Foundry Company has been awarded contract for furnishing 3,000 tons 6 to 24-inch cast-iron pipe, at \$25.20 per ton; the Camden Iron Works, 140 Mathews fire hydrants, 6-inch connection, 9-foot brick, at \$41.75; James B. Clow & Sons, gate valves, as follows: 145 6-inch, \$13.80; 10 8-inch, \$21; 12 12-inch, \$39.25; 24 16-inch, \$87.60; 2 24-inch, \$263.50.—Andrew Rinker, City Engineer.

**Mankato, Minn.**—The State Board of Control, P. M. Ringdahl, Chairman, St. Paul, received the following bids for the construction of the model school building at the State Normal School here: J. B. Nelson & Co., Mankato, \$72,110; E. A. Carlstrom, Mankato, \$74,681; Neitge, Mankato, \$74,875.

**St. Paul, Minn.**—The Board of Water Commissioners, John Caulfield, Secretary, has awarded the contract for a concrete conduit at Lake Pleasant and Sucker Lake to J. H. Donohue, Gilfillan Block, St. Paul, at \$10,447.

**Winona, Minn.**—Abell & Braley, Winona, have been awarded contract for 10,775 square yards 4-inch brick pavement, on 6-inch gravel and 2-inch sand foundation, at \$1.30, including excavation, and 12,295 yards at \$1.29; also for setting 3,600 linear feet new limestone curb, at 87 cents, and resetting old curb, at 7 cents, on Main and Center streets. The total amounts of all bids received were: Abell & Braley, \$29,868.05; James Forrestal, St. Paul, \$38,065.60; John Degnan, Winona, \$34,482.05; Fielding & Shepley, St. Paul, \$34,835.70; La Crosse Stone Company, \$35,297.10; F. A. Coones, Winona, \$34,620.20; Bittner & Fankke, Winona, \$35,835.85.—H. B. Walling, City Engineer.

**St. Louis, Mo.**—The Standard Reduction and Chemical Company, promoted by W. F. Miller, of Pittsburg, Pa., has received the

contract for disposing of the city garbage, on its bid of 27 cents a ton.

**St. Joseph, Mo.**—The Land Construction Company has been awarded the contract, at \$4,000, for three vitrified pipe lateral sewers.—D. L. Lawlor, City Engineer.

**Missoula, Mont.**—The Board of Trustees of the Missoula County high school opened bids for the new county high school building, eight being submitted, ranging from \$34,000 to \$26,900; the latter by Olson & Johnson of Wallace, Idaho; it being the lowest, was accepted. The bids for the foundation and the heating plant have already been let.

**Lincoln, Neb.**—The Western Gas Company, of Fort Wayne, Ind., has been awarded a contract to erect a water gas plant in Lincoln.

**North Platte, Neb.**—Matt & O'Brian, Independence, Mo., have been awarded contract for constructing sewers, for \$3,286.50; Conrad Walker bid \$3,762.10; McKay & Cathro, \$3,782.40; Lank & Browitt, \$3,770.45. The details of the low bid follow: 4,840 feet 10-inch vitrified clay pipe; loam, clay and sand excavation, at 60 cents; 112 6x10-inch Y's, \$1.75; lampholes, \$5; no rock excavation; no pavement to replace or remove; no surface water inlets; manholes, 5 feet deep, 4 feet square inside, \$22.50; frames and covers extra; flush tanks, 16 feet long by 4 feet high and 4 feet wide, of concrete, 1:3:5, including flushing appliance, \$22.50; sheathing left in trench, \$30 per M; wages of common labor, \$2 per day; manholes are concrete, 4 feet square in the inside with 6-inch walls battered so as to use standard 2-foot manhole frames and covers; proportions of concrete 1, 3 and 5; average depth of trench is 5 feet; there is about one foot of sand and water to take care of; part of this sand is almost quicksand; connecting flush tank with water-mains and manhole frames and covers are paid for as extras.

**Omaha, Neb.**—Hugh Murphy, 246 Bee building, has contract for asphalt and brick paving, and C. E. Fanning, 511 Bee building, has contract for brick paving.—James Dahman, Mayor; Andrew Rosewater, City Engineer.

**Jersey City, N. J.**—The Street and Water Board has, as the result of a series of conferences, awarded a five-year electric lighting contract to the Public Service Corporation at \$75 per light per year. Under the five-year contract, which recently expired, the price was \$97.50. Mayor Wittmann and the Street and Water Board got the Public Service Corporation to grant an additional concession to the effect that when the number of street lights in Jersey City reaches 2,500 the price shall be further cut down to \$70, just as is the case in Newark. At present Jersey City has about 1,600 electric street lights.

President Heavey of the Street and Water Board has made a twenty-five-year contract with the Erie Railroad Company, binding the Erie to take its water supply from Jersey City at \$80 a million gallons. Last year the Erie took about \$108,000 worth of water from Jersey City. It is also expected that the Pennsylvania Railroad Company will follow suit and also enter into a long term contract with Jersey City, after which the other railroads may also be secured by long-term contracts.

**Newark, N. J.**—The Board of Street and Water Commissioners have been awarded contracts as follows: John Fox & Company—Furnishing 629 tons 4 to 8-inch pipe, \$23.65; 327 1-4 tons, 10 to 16-inch pipe, \$23.20; 24.35 tons, 20 to 24-inch pipe, \$23.20; 75,000 lbs. special, at 2½ cents; total \$24,907.97; M. J. Drummond & Company bid \$25,115.22; U. S. Cast Iron Pipe and Foundry Company, \$26,204.04; Warren Foundry and Machine Company, \$25,094.95; Lynchburg Foundry Company, \$25,809.06.

**Neptune Meter Company (Trident meters)**—1,400 5-8-inch, \$8.40; 100 1-inch, \$16.80; ten 1 1-2-inch, \$30; thirty 2-inch, \$50; ten 3-inch, \$85; three 4-inch, \$175; three 6-inch, \$375; total, \$7,740; Thomson Meter Company, \$17,740; Hersey Manufacturing Company, \$17,745.

Fred Bowden and H. E. Ogden & Sons Company were each awarded contract for furnishing half the supply of 40,000 feet 6-inch, and 10,000 feet 4-inch, vitrified salt-glazed sewer pipe and 2,520 specials at \$2,936.20 each.—M. R. Sherrerd, Chief Engineer.

**Perth Amboy, N. J.**—Mayor Bollschewler and James Quinlan, a representative of the Eureka Fire Hose Company, of New York, the firm which was recently given the contract for furnishing the Fire Department with 1,500 feet of hose, have signed the contract. The hose is of Paragon brand and will cost \$1 per foot.

**Trenton, N. J.**—Council has awarded the contract for supplying 600 gas lamps to the Public Service Corporation for \$28.75 per lamp per year for five years; the bid was \$29.75 per lamp per year for three years and \$28.75 per lamp per year for five years; the last contract was let for three years.

The Filbert Paving and Construction Company was awarded the contracts for repaving Factory and South Stockton streets with sheet asphalt.

**Albany, N. Y.**—Superintendent F. C. Stevens, of the State Department of Public Works, has awarded the contract for the completion of the work embraced in barge canal contract No. 17, for the construction of two dams in the Mohawk river at Amsterdam and Tribes Hill, to Alexander Murdock, of Baltimore, Md., his bid being \$804,515, a slight increase over the original contract price; the contract which was originally awarded to the Scofield Company, was cancelled on account of the embarrassment of the contractors.

**Auburn, N. Y.**—Jerry Corkery has been awarded contract for constructing the Elm street sewer from Franklin to Capitol street at a cost of \$1,156.40.

**Rochester, N. Y.**—The Board of Contract and Supply has let the contract for installing two new pumps at the Brighton sewage pumping station to F. H. Falls for \$4,469; the pumping station is to be used in connection with the new Twenty-first Ward sewer. Bids on the Atkinson street macadam pavement were received as follows: F. C. Lauer, Sons & Company, \$14,612.50; F. V. Brotsch Company, \$14,676; Whitmore, Rauber & Vicinus, \$14,710; William Fuller, \$14,725; H. B. Hooker, \$14,765; Hagaman, Miller & Hagaman, \$14,869; H. N. Cowles, \$15,050; F. A. Brotsch, \$15,527; Brayer & Albaugh, \$15,620.50; Holter & Ward, \$15,975.50.

Ription & Murphy were low on the Gillette street sewer, with a bid of \$348.75, and H. B. Hooker & Son for Bay street sewer, at \$5,273.50.

Snow cleaning contracts were let as follows: Fulton avenue, Pierpont and Augustine streets, George Bantel's Sons, 3 cents a foot; Swinerton street, Charles Elam, 3 cents; Railroad street, Henry Schoenfeldt, 11-2 cents; Staud street, Crouch Brothers, 23-4 cents; Rosslyn street, William Baker, 21-4 cents. Reservoir avenue bids were returned as the specifications are to be changed.

**Troy, N. Y.**—The Board of Contract and Supply has awarded the following contracts for furnishing hose to the Department of Public Safety: J. M. Warren & Company, 1,000 feet at 95 cents per foot; McCormick & Dunn, 1,000 feet at 95 cents; Barnum Brothers, 1,000 feet at 80 cents; William Cottrell, 1,000 feet at 84 cents; M. E. Avery, 500 feet at 65 cents.

The contract for furnishing a garbage ground in the North End was awarded to George Wiltzie at \$40 per month. He is to provide a man to level off the refuse.

The following proposals were received for installing a boiler for heating purposes at Fifteenth street Fire Headquarters in the North End: William Bailey, Jr., \$288; John F. Knaupp, \$320; Gerlach & Bolton, \$294. The bids were sent to the Commissioner of Public Safety for investigation.—E. L. Grimes, City Engineer.

**Watertown, N. Y.**—Mulder Brothers, Albany, were low on paving 3,750 square yards, Leroy and Main streets, with Medina sandstone block pavement at \$3.79 per square yard, bid including excavation and foundation; also for 750 yards between car rails, at \$4.12; W. J. Semper, Brownsville, was low on vitrified paving block of N. Y. Brick and Paving Company, at \$2.43, and \$2.87 between tracks, also for track brick; C. O. McCourt of Syracuse also bid \$2.43 for track brick, and \$2.49 between rails, and \$2.37 for Standard or repressed block, and \$2.45 between rails; Mulder Brothers were also low on Johnsonburg paving block at \$2.44, and \$2.67 between rails.—Henry E. Baker, City Engineer.

**Eaton, O.**—E. M. Gephart & Company, of Dayton, was low bidder for constructing sewers and a disposal plant, including 109,500 feet 6 to 24-inch pipe; 8,830 feet 27 to 42-inch brick or concrete sewer, manholes, etc., 4 to 24 feet deep, bids for which were received February 18, at \$101,452.20, including manholes, at \$25; flush tanks, including flushing appliance, \$50; rock excavation, \$3 per cubic yard, sheathing left in trench, \$35 per M; wages of common labor \$1.75 per day. Other bids were: Paul & Kirschner, Dayton, \$109,334.91; J. N. Bick, Toledo, \$111,944.26; Quill & Poos, Cincinnati, \$114,904.40; Charles F. Sullivan, Dayton, \$105,727.32; Hunker & Williams, Springfield, \$115,194.81; W. J. Townsend & Company, Cleveland, \$111,018.35; Pease & Buzatt, Indianapolis, Ind., \$102,914.39; Hannon & Steverling, Springfield, \$107,932.53; McCarty Brothers, Cincinnati, \$123,673.07; T. J. Backus Construction Company, Dayton, \$122,776.92; Reese & Larkin, Dayton, \$110,216.38; John B. McLane, Newport, Ky., \$105,202.85; H. C. Gass, Belleville, \$107,533.58; Municipal Construction Company, Kansas City, Mo., \$115,271.71; A. P. Southworth & Company, Adrian, Mich., \$120,621.70; B. F. Sweeten & Son, Camden, N. J., \$107,821.06; C. T. McCracken, Charleston, W. Va., \$105,544.95; Hunt & Wigley, Akron, O., \$123,653.86; W. E. Percell, Lorain, O., \$125,243.14.—A. L. Reid, City Engineer.

## TRADE NOTES

**Cast Iron Pipe.**—Chicago: Prices offered in recent competitive bids show a tendency toward greater firmness. Quotations: 4-inch, \$30; 6 to 12-inch, \$29; 16-inch and up, \$28, with \$1 extra for gas pipe. Birmingham: It is understood that the lowest prices for years have recently been reached as a result of sharp competition for water pipe contracts. Quotations: 4 to 6-inch, \$28; 8 to 12-inch, \$26; over 12-inch, average \$25, with \$1 extra for gas pipe. New York: Manufacturers reported less disposed to compete sharply for work. Quotation, \$25 to \$25.50 per net ton at tidewater.

**Pig Lead.**—Rumors of price cutting are current, but not confirmed. General market dull and unchanged. Quotation, New York, 3.75 c.; St. Louis, 3.65 c. London prices have declined, a new low record of £13 17s. 6d. has been made.

**Macadam Specifications.**—Of interest to contractors for macadam pavements are the specifications published by the Wadsworth Stone and Paving Company, 405 Bessemer Building, Pittsburg, Pa. The foundation of the Wadsworth macadam pavement is laid in accordance with good practice in making macadam roads. The percentage of fine material mixed with the layer base stone is an excellent requirement, preventing the sinking of the macadam into the subsoil when the rolling process is going on, thus obviating waste of material that otherwise might be required to bring the roadway up to grade. To convert this roadway into a Wadsworth macadam road, almost an inch of Kentucky rock is rolled into the surface binding it together and making it waterproof. A copy of these specifications will be sent to anyone on application to the company.

**Water Company Election.**—The annual meeting of the stockholders of Somerset Water and Power Company was held in Somerset, Md., at the residence of Dr. C. A. Crampton. The directors elected were: J. W. Stohlman and W. H. Rice, of Somerset, and D. A. Smith, Lee D. Latimer and P. K. Thurston, of Drummond. The directors elected the following officers: D. A. Smith, President; Lee D. Latimer, Vice-President; J. W. Stohlman, Secretary and Treasurer; P. K. Thurston, Assistant Secretary and Treasurer.

**Big Power Plant.**—M. H. Gerry, General Manager of the Helena Power Transportation Co., has returned to Helena, Mont., from New York and announced that financial arrangements had been completed for building the third great dam across the Missouri river near Helena. This will make Helena the second largest initial electrical power point in the world. It is estimated that it will take twenty-one months to complete the dam, which will generate 50,000 horsepower. The new dam will cost upwards of \$10,500,000.

## PATENT CLAIMS

879,557. Automatic Flow-Controller. John W. Ledoux, Swarthmore, Pa., assignor to Simplex Valve & Meter Company, Camden, N. J., a Corporation of New Jersey. Serial No. 383,188.

The combination of a conduit having a contracted section, a chamber connected with said section so that liquid flowing in said conduit rises in said chamber, a device movable in said chamber by liquid controlled by the head inducing flow in said conduit, a valve for controlling the flow through said conduit, and mechanism connecting said device with said valve so that the position of said device regulates the position of said valve.

879,664. Voting Machine. Angus McKenzie, Jamestown, N. Y., assignor, by mesne assignments, to U. S. Standard Voting Machine Co., Rochester, N. Y., a Corporation of New York. Serial No. 673,459.

In a voting machine, the combination of a plurality of separately operable ballot indicators, means for operating a plurality of said indicators simultaneously, a part connected to each of said ballot indicators and normally moved by said means, said part being mounted independently of said means and said indicators and adapted to be disengaged from said means.

879,688. Pipe Lining. James A. Snoddy, Seattle, Wash. Serial No. 358,576.

The combination, with a conduit, of a lining therefor composed of a plurality of blocks having their outer surfaces conforming to the inner surface of the conduit and having their inner surfaces concaved, the blocks disposed transversely of the conduit with their side faces in contact and each block provided with transverse recesses near the ends opening into the concaved surfaces and adapted to register when the blocks are disposed within the conduit, binding strips bearing in said recesses and extending over a plurality of blocks, and means for fastening said strips to the conduits.

## INCORPORATIONS

American Light, Heat and Power Company, Westfield, N. J.; to transmit and distribute electric current for light, heat and power; capital, \$250,000. Incorporators: George L. Delatour, as above; G. R. Lepard, 444 Water street; Alfred Worsnap, 280 Broadway, both of New York.

Continental Construction Company, Camden, N. J.; contracting, construction, building materials, etc.; capital, \$50,000. Incorporators: William G. August, Atlantic City, N. J.; Joseph J. Sleeper, Philadelphia; Adam R. Sloan, Atco, N. J.

Current Saving Electric Lamp Company, New York, N. Y.; to manufacture electric lighting machinery, lamps, bulbs and fixtures; capital, \$20,000. Incorporators: Robert S. Kennedy, 502 West 151st street, New York; Daniel W. Moor, 31 Dry Harbor Road, Richmond Hill, N. Y.; Harry D. Hooge, Ocean Grove, N. J.

Monolithic Engineering Company, New York, N. Y.; to construct buildings, bridges and other works; capital, \$100,000. Incorporators: D. A. Reynolds, E. P. Clarke, E. A. Reynolds, 32 Broadway, New York.

Pineville Water-Light Company, Pineville, W. Va.; capital, \$10,000. Incorporators: R. A. Keller, E. B. McClure and others.

U. S. Waterproofing Company, New York, N. Y.; to manufacture waterproofing materials and construct buildings; capital, \$100,000. Incorporators: Charles C. Bunker and J. Wallace Bunker, 21 Park Row, New York; Charles F. Carpenter, 72 Division avenue, Brooklyn.

Union Independent Telephone Company, Augusta, Me.; telephones; capital, \$200,000. President and Treasurer, J. Berry; Clerk, L. A. Burleigh, both of Augusta.

Waggoner Sanitary Fire Bucket Company, 414 Oxford Building, Chicago, Ill.; to manufacture fire extinguishers; capital, \$10,000. Incorporators: A. E. Waggoner, George W. Linden, A. E. Waggoner.

## Proposals

## FURNISHING AND LAYING SEWER PIPE AND BUILDING SEWAGE DISPOSAL WORKS

Auburn, N. Y., January 27, 1908.

Sealed proposals will be received by the Mayor, Hon. C. August Koenig, until 8 p.m., March 17, 1908, for the construction, first, of sewers and appurtenances thereto; second, for the construction of a disposal works for said sewer system. The sewers to consist approximately of the following: 14-700 feet of 8-inch, 11,300 feet of 10-inch, 6,000 feet of 12-inch, 3,600 feet of 15-inch, 300 feet of 18-inch, 1,250 feet of 20-inch.

Excavation varies in depth from 5 to 18 feet. There will be approximately 16,000 cubic yards of excavation, a part of the same being in solid rock. There will be about 17,000 feet of 5-inch vitrified tile for house sewer connections to be laid from the main sewer to the curb line. There will also be laid in the main trench and underneath the main sewer, as ground water demands, subsoil drains about as follows: 20,000 feet of 4-inch, 6,000 feet of 6-inch, 7,000 feet of 8-inch, 2,000 feet of 10-inch, 200 feet of 12-inch. All of the subsoil drain tile to be vitrified tile known as seconds. 84 manholes with an average depth of 9 feet; 12 flush tanks, 12 lamp holes.

The disposal work consist of reinforced concrete, septic tanks, and contact beds, and automatic appliances for dosing them.

For the sewers a bond for an amount equal to double the gross amount of the contract, or a certified check for \$5,000 will be required of all bidders. For the disposal works a bond for an amount equal to double the gross amount of the contract, or a certified check for \$2,500 will be required of all bidders. The contract will be let in two sections—Section 1 to consist of all sewers and appurtenances to the same, and Section 2 of the disposal works. Bidders may bid on either or both. The Common Council reserves the right to reject any or all bids. Specifications, general plans and blank forms of proposal may be seen at the office of the City Engineer, W. Thomas Wooley (from whom further information may be obtained, and will be ready for distribution February 15, 1908.

J. S. HANLON,  
City Clerk.

## DEBENTURES FOR SALE

City of Sherbrooke,  
Province of Quebec, Canada.

Sealed tenders will be received by the undersigned up to noon of Friday, the twentieth day of March, A. D. 1908, for the purchase of one hundred and seventy thousand dollars (\$170,000) worth of twenty-five years annuity debentures of the City of Sherbrooke, Province of Quebec, Canada, bearing interest at five per centum per annum. Interest and Principal payable in half-yearly payments of five thousand nine hundred and ninety-three dollars and eighty-six cents on the second day of October and April in each year.

Tenders to be marked "Tenders for debentures."

For copies of by-laws and other information apply to the undersigned.

F. J. GRIFFITH, Sec'y-Treasurer.

(10-11)

## WANTS

WANTED—A young engineer, with some experience in street paving and sewer construction, as assistant to City Engineer; salary, \$75 per month. Address City Engineer, giving age, experience and recommendations, P. O. Box 271, Meridian, Miss.

TWELVE offices, covering entire field of municipal and public work; positions open in engineering, drafting and office work; information free; write us to-day. Hapgoods, 305 Broadway, New York; or 1010 Hartford Bldg., Chicago.

WANTED—Men on every job where artificial lighting or portable lights are required; liberal commission will be paid. A. M. C., care Municipal Journal and Engineer.

**J. LEOPOLD & CO.**  
18 BROADWAY, NEW YORK

# GRANITE

Paving Blocks of all kinds furnished in any quantity  
Quarries: Wellesley Island St. Lawrence River, N. Y.  
Vinalhaven, Maine

We are prepared to make deliveries to all Western Cities on the lakes

# RAILS

SEND FOR OUR WEEKLY  
LIST COMPRISING OVER  
1,000 ITEMS

**Locomotives  
Contractors' Equipment**

Walter A.

# "ZELNICKER"

SUPPLY CO., IN ST. LOUIS